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ENGINEERING EDUCATION

Thorough Knowledge of Basic Sciences Together With Academic Cultural Training Should be Established as Pre-requisites For Entrance to Professional School

ELSEWHERE in this issue appears the fourth in a series of articles prepared by President Steinman, of the National Society, upon the general subject of "What Is Wrong With The Engineering Profession." It is unquestionably a most timely and effectively presented dissertation and merits the attention of and the utmost consideration from the public, the profession and the school of engineering. If it appears strange, to the latter agency, that the public should be specified let it not be forgotten that the purpose of training young men for a profession is to invest them with a character and a knowledge useful to society. No professional man can be a world or even an existence unto himself.

Far too long has engineering education been made an invitation attractive to the uninitiated and an instrument for increasing enrollment in many of our most prominent institutions of higher education. The professions of law and medicine have in many states long since demanded pre-qualification for entrance to professional training. Yet, engineering colleges which should exact an even more thorough preliminary knowledge and character than is required of either law or medical students, continue to solicit and canvass the secondary schools, ofttimes with misleading propaganda.

The Engineers' Council for Professional Development has just issued a bulletin which advises that recently in Detroit a guidance meeting assembled 123 high school boys and their parents. The purpose of this meeting was to give students an insight into, and an opportunity to consult with representatives of, the various branches of engineering. One wonders whether the need for a thorough training in fundamentals and a cultural approach were set forth as desirable prerequisites for matriculation in a professional school.

Surely there can be little question of the necessity for a thorough general academic training for any professional man. This should be followed by a general professional course which would train him to qualify for entrance to the general practice of his calling. Then, and then only, should he pursue scholastic or personal studies with a view to recognition as a specialist.

As pointed out by President Steinman, who, as a teacher and member of a professional examining board, as well as a practitioner of distinction, is eminently qualified to pass opinion thereon, a thorough knowledge of mathematics and physics underlies and is indispensable to the responsible practice of engineering. Presuming that he includes chemistry within the scope of general physics one might, with justification, contend that a man who had thoroughly mastered these subjects would with experience prove a far more qualified engineer than one who had studied fifty-seven applications of the same under the various designations of a curriculum without ever having acquired complete understanding of and ability to use these fundamental branches of human knowledge. With a mastery of a subject comes the philosophy of the same and without such philosophy education is mere repetition destined for little if any fruition.

That a pre-professional course of two years should be required of prospective engineering students is a subject that is much in the thoughts of engineers who are closely allied to public affairs. The engineer can no longer remain a silent cog in the machinery of a society which cannot exist without him. He must be articulate and capable of contending on an equal basis with the representatives of business and the other professions in helping to direct the affairs of government. Two years spent in an intensive study of general mathematics, history, literature, philosophy and at least one foreign language is none too much for the average man to prepare himself for professional matriculation. With such foundation three years of general engineering study should, when amplified by an apprenticeship of three to four years, prepare one sufficiently to enable him to seek, through examination, admission to the profession. As with every professional man, his career then begins and his additional preparation for specialization must be carried on as circumstances and opportunities permit.

To establish standards is a duty of the profession and the creation of governmental agencies as a means of proving the qualifications of aspirants should be the concern of public spirited engineers. No two men are equal in talent or energy and the knowledge supposedly to be gained from a two-year pre-professional or a three-year professional course may, in one case, be attained in half the time and in another may require twice the allotted period. It is not a question of when, how or in how long a space of time has the knowledge been acquired, but rather can it be demonstrated. Hence, the court of governmental opinion rather than scholastic semesters. The most farsighted colleges are today modifying their requirements of time. In some cases, a man may earn a degree in a single year if he can pass the required tests. And why not? The degree supposedly represents learning, not time.

It is to be hoped that President Steinman's article will cause sufficient discussion to justify a general movement to establish a thorough training in general academic and engineering knowledge that will lead to

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EMPLOYMENT FOR ALL

An Interesting and Ingenious Proposal

Would Create Re-employment Fund By Levying Assessment on Purchases

By
WALTER P. SHUETTE
(Engineer Author Wins Award from Scripps-Howard Paper)

FOUR score and seven years ago, our fathers brought forth upon this continent a new nation, conceived in liberty and dedicated to the proposition that all men are created equal.

These words of the great emancipator, Abraham Lincoln, are a challenge to every American to exert his talents in an endeavor to formulate some *definite* and *practical* program to carry on his ideals. When our great nation is threatened by other and *foreign* doctrines because we have failed to afford the opportunity and preserve the birthright of every American citizen to *work for* and *earn* his daily bread, the challenge becomes even greater. We must provide *continued* employment for those who are now unemployed and able to work. Such employment must afford them sufficient remuneration to provide the necessities of life and at least a few luxuries which our country's bounteous resources justify.

Six and a half years after the beginning of our present economic depression, we now find after three years' application of strenuous emergency measures designed to improve conditions in general, that: Business conditions have improved somewhat, governmental indebtedness has increased tremendously, and unemployment has decreased but slightly. Providing the unemployed with "relief" or a temporary job on a "Federal Work Relief Project" does not secure his future.

Compare our position with that of the rest of the world. In Europe and Asia there are many over-populated countries, whose natural resources cannot support their populations. For this reason they are dependent to some degree upon international trade for their existence and living standards. Our position is a more fortunate one. The natural resources of our country can support a population several times our present size. For this reason we contend there is no *valid* excuse for anyone in this country to be insufficiently fed, clothed, or sheltered until a day when our population has increased beyond the ability of our natural resources to supply the needs of everyone.

In the year 1929 our national industrial production was 80% of productive capacity. In the year 1932 we were producing only 54% of capacity. We have experienced a slow improvement since 1932, but it will take a long time to reach the economic status of 1929 at the recent rate of improvement.

We are now following a policy of caring for eleven million unemployed, partly through work relief and partly by direct relief. No sane American will dispute the necessity of providing for them in some way, although there is a divergence of opinion as to the method. The safe and logical way to take care of them is to absorb them through remunerative work in existing private industry. This is at present actually happening, but too slowly to relieve us of the burden for many years.

There is room for our unemployed in private industry *right now*. Herewith is proposed a program whereby *private enterprise* can absorb the unemployed employables in less than a year's time. This program is operated on a "pay-as-you-go" basis, and does not pile up bonded indebtedness for *future* generations to bear. It does not employ any *coercive* methods by government toward industry. It uses the force of *competition* to cause an employer to increase the number of his employees rather than decrease their number, as is the present competitive effect. The expense of operating the plan is even less than the present method of direct relief, because government merely acts in a "supervisory and depository capacity" rather than "supervisory and administrative." The funds necessary to start the plan are derived from the consuming public, and amount to a maximum of 3% of the present annual national income based on a figure of approximately sixty billion dollars. The cost begins to decline after the first few weeks of operation, and quickly drops to nothing concurrently with the absorption of the unemployed into industry.

The program is as follows:

All domestic commercial purchases from factories, wholesale and retail establishments, (excepting such items for which public demand would not increase with an increase of public purchasing power), would be accompanied by a "Re-employment Assessment." The medium of conveying this assessment will be called a "Re-employment Certificate." These certificates would be purchased through the Post Office Departments locally by the party who sells the goods. When a sale is made, the purchaser pays for his goods at the regular selling price, plus the amount of the "Re-employment Assessment." "Re-employment Certificates" will be presented to the purchaser, who cancels them by marking with indelible pencil or ink provided by seller. He then returns them, cancelled, to the selling agency.

These "Re-employment Certificates" will be used by the party who sells the goods, in only one way: to pay wages for re-employment labor. The local Re-employment Office, at present a Federal Agency, would be contacted to secure employables to be interviewed for employment. The workers selected would be put to whatever duty the business organization decides. If they should decide that this "back-to-work" movement will immediately increase the demand for their goods,

they would put some or all of these men on production or sales work. If they are not expectant of an immediate increase of business, they could place these men at miscellaneous occupations within their institutions, making preparation for future business expansion. If any organization refuses to put men to work, they would be operating under a handicap when compared with competing organizations who have the good judgment to put these men to work in a beneficial and profitable way.

At the end of the work week these re-employment employees are paid their wages with the cancelled "Re-employment Certificates." These certificates, in turn would be taken by the workers to the Re-employment Office where an order would be written on the Post Office for the total amount due the "Re-employed" worker. These orders for pay then are to be cashed at the Post Office where the "Re-employment Certificates" were purchased.

Business organizations all over the country could anticipate the amount of "Re-employment Certificates" which they would require per week by multiplying the assessment rate for their classification of business by their average weekly sales.

The assessment rate for retail establishments would be based on the percentage of payroll cost to sales volume for each type of retailer as determined by the United States Department of Commerce in their "1935 Census of Retail Distribution." Their 1933 Census gave an average of 11.62% ratio of payroll against sales for all retail establishments. The assessment rate would be set at a figure which would enable each type of retailer to take on a number of re-employment employees equal to one-fifth the number regularly employed, with the provisions that the re-employment employees would be paid 75% of the wage of the regular employees. For example, consider a hardware store doing an average business of $3,333.33 per month with five employees whose wages average $80 per month each. The payroll cost would in this case be 12% of the sales volume, as taken from the 1933 Census figure for hardware merchants. The "Re-employment Assessment Authority" would determine the "Re-employment Assessment Rate" by the simple computation 12% times 20% times 75% which equals 1.8%. Multiplying $3,333.33 by 1.8% would give "Re-employment Certificates" in the amount of $60 for each average business month. The hardware merchant would be able to employ one additional man full time at $60 per month. Retail merchants doing smaller volumes of business would have proportionately, sufficient certificates to hire persons for part-time work, benefiting them during certain periods when extra help is required.

The assessment rates for sales on retail businesses would vary from a maximum of 2.2% for some department stores to a minimum of .8% for country general stores, but the average for all retail establishments would be 1.8%.

The assessment rates for wholesale establishments would be based upon the same factors as the retail assessment rates, and figured in a similar manner, using the relation between payroll cost and sales volume as determined by the United States Department of Commerce in their "1935 Census of Wholesale Distribution."

The assessment rates on sales by wholesale businesses would be less than the rate on sales by retail businesses, because the labor involved in wholesale business is less than in retail business. The average assessment rate for all wholesale establishments would be .8%.

The assessment rates for sales by manufacturers would be figured in the same way as the rates for retail and wholesale organizations, the relation between payroll cost and sales volume being based upon data furnished in the "1935 Biennial Census of Manufacturers." The average rate for all classes of manufactured articles would be 2.5%.

The re-employment assessment on purchases of the above three classes of goods would thus operate, by means of competition, to immediately force an increase of 20% in employment in these three classes of business. The number of workers which would be added directly by this means would be approximately three and one-third million by the time our 1929 employment status would be reached.

Concurrently with the expansion of workers and production, there would be a total increase in purchases by consumers which would equal the difference between the additional amount of money spent by the new wage earners and the amount of sales diminished as a result of any increase in price due to the sales assessment levy. Since the employer is able to get labor service exchanged for the assessment which is paid by the purchaser, he should in most cases be able to sell his merchandise at a price sufficiently reduced to absorb this re-employment assessment through increased sales and production brought about by the greater demand. In cases where the employer could not immediately realize any advantage in increasing his workers, he would, of course, be compelled to pass the assessment payment on to the consumer. This would not decrease the volume of goods sold in proportion to the assessment, because 77% of our consumptive expenditures are made by the half of our population in the higher income class, which in the year 1929 were families having incomes in excess of $1,700 per annum. People in this class are more inclined under stress to reduce their savings rather than to reduce their living standard.

The increase in purchases and production by these new wage earners would not continue long before increasing the demand for materials from farm and mine. This would in turn force increased employment in these lines of endeavor, and the combined increase in purchasing power of all these new wage earners would in turn increase the demand for other commodities such as: electric power, telephone service, gas, railroad and truck transportation, hotel service, new buildings and houses, amusements, in fact every necessity and luxury.

The resulting increase in volume of business would justify a substantial increase of regular employees by retail, wholesale and manufacturing organizations. They will transfer such employees as they deem meritorious, from the "Registered Re-employment Class" to the "Regular Employment Class" at the regular pay scale.

Since the amount of money accruing from the re-employment assessment would continually increase with the ever increasing volume of business, it is reasonable that the number of persons qualified for re-employment would soon be exhausted. When this condition would

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MISUSE OF THE TERM ENGINEER

A Consistent Campaign of Education

Calling for Cooperation from Agencies Concerned Will in Time Produce Results

By
HARRY E. HARRIS

THE term "engineer" and the profession of engineering have been clearly defined in the Model Law and in statutes enacted in many of our states.

The term "railroad engineer" means the scientific and gifted individual who can start laying a railroad simultaneously with Irish laborers from the Atlantic, with Chinese laborers from the Pacific, and have the approaching opposite operations meet in mid-continent to an inch when completed; it means that highly educated and accurately trained men who can start a tunnel through a large mountain or under a wide river from both sides and guide uneducated labor so that it can break through from the opposite side in the identical spot laterally and vertically. He is the man that after the railroad is completed according to his specifications and under his directions, lays down its operation and maintenance plans so that it may be operated year in and year out shuttling passenger trains, freight trains, emptys and mobile maintenance units and keeps its multitudinous traffic moving without interference. While he is required to know all about the design, construction and operation of engines, he is not an engine man or an engine driver and most likely has never opened a locomotive throttle.

To call a man, trained to control and run a locomotive a "railroad engineer" would be similar to calling a hospital orderly, "doctor," or calling a process server, "lawyer." Why not as well call a trolley motorman or a bus line driver an engineer?

A power engineer or power plant engineer is an equally highly educated and trained scientific individual who can evolve and create such immense things as the Hoover Dam power project, or the immense steam and electric power plants which furnish power for electrified transportation, to our factories, our homes, and our farms.

To call the man who opens the throttle, feeds the fuel and keeps things lubricated, a "power engineer" or a "stationary" engineer is like calling a soda clerk, a pharmacist or a cocktail mixer, a chemist.

It is true that the orderly by dint of many years of hard study and practice may become a physician; the process server, a lawyer; and the soda clerk, a pharmacist. However, there is no inter-connection between the professions of Doctors, Lawyers and Pharmacists and the work of orderlies, process servers and soda clerks any more than there is between the bank president and the statement clerk. They are simply at different ends of the same complex organization and employed in entirely different and practically unrelated activity.

A machinist is not a mechanical engineer, nor does he call himself one, but he can become one, with years of study providing his mind is of the right subjective type that can visualize things that do not exist and bring them into being. To be a successful engineer requires possession of a brain peculiarly endowed with mathematical, analytical and creative aptitudes.

If a skilled mechanic operating machinery does not call himself a mechanical engineer, why should a skilled mechanic operating any kind of an engine call himself any kind of an engineer, when he isn't?

If he is an engineer because he can start and stop an engine, control its power and its intake of fuel, then you yourself, your wife, sister and daughters are all engineers, every time that any one of you start your automobile. Your automobile motor is a much more complicated and highly sensitive engine and has a great deal more flexibility than a steam engine whether it be locomotive, stationary, or marine and the functions you perform are the same as those performed by power plant, stationary and marine engine men. Still that doesn't make an auto driver an "engineer."

Of course you may in addition to being an ordinary driver, be one of the few who are able to design and construct automobile engines, in that case you are much more than a mere engine operator, you are an Automotive Engineer and entitled to be licensed as such and your professional status recognized. However, if you are only able to make repairs, you are not an engineer but an engine repairman or automobile mechanic only, in addition to being a driver or operator.

As we do not call a bricklayer, a structural engineer; nor a carpenter, an architect; nor a rodman, a civil engineer; nor a machinist, a mechanical engineer; a prescription clerk, a chemical engineer; a farm hand, an agricultural engineer; an electrician, an electrical engineer; why call an engine operator an engineer? Why not some name that would honestly describe him and his highly respectable and important trade?

Machinist, electrician, rodman, farm hand, iron worker, carpenter, etc. all are names of honorable callings, why should the engine operator be ashamed of his trade and resent being known by a suitable appellation such as enginist, enginician, engine man, power hand, locomotive driver, motivator, or some equally euphonic and definitely correct term? Why should he be called something that he is not, why appear to pretend to belong to a profession when his calling is a trade? Calling him an "engineer" doesn't make him an "engineer" any more than calling the earth flat, makes it flat.

However, this is a question that will work itself out in time with the education of the public. If you claim

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ENGINEERING EDUCATION

The Fourth of a Series of Articles
From the Pen of the President of N. S. P. E.

"What Is Wrong with the Engineering Profession"

By
D. B. STEINMAN

WHILE there are many individual engineering educators who are endowed with vision and with cooperative understanding of the Profession's problems and aspirations, the group as a whole has displayed remarkable backwardness, rationalization, non-cooperation, and even selfishness at the expense of the best interests of the Engineering Profession. My indictments against engineering educators may be summarized under six headings:

1. They have obstructed, or have failed to cooperate with, the advance of the Engineers' Registration movement.

2. They have built up a chaotic and inconsistent system of engineering degrees, and they are backwardly or selfishly clinging to such degrees for the lure of students and to the confusion of the public.

3. They are using every weapon of attack, alibi, and rationalization to oppose the suggestion of selective limitation of student enrollment.

4. Under the cloak of "vocational guidance," they are using every means of propaganda and proselytizing among high school students to swell engineering school enrollment beyond the capacity of the Profession to absorb.

5. They are resisting every suggestion to raise engineering education toward a graduate level.

6. They are, in individual cases, competing with their own graduates by seeking and taking engineering retainers on terms that are destructive of the standards of the Profession.

There are, as I have stated, many notable exceptions; but there are others, including some of the leaders and spokesmen of the group, who have defended or rationalized obstinate resistance and selfish opposition to any genuine program for the advancement of the status of the Engineering Profession. No other profession has been so handicapped by the non-cooperation of its own educators. Apparently engineering educators, in large measure, are actuated only by a desire to secure ever-increasing enrollments for their courses, without any real concern as to what becomes of these students after they graduate.

1. Engineering educators have obstructed, or have failed to cooperate with, the Engineers' Registration movement. I do not know why. Charge it to ignorance or to characteristic resistance to progress. "Shall Engineering be a closed Profession?" is the issue they have raised. They do not realize that Registration has done more than anything else to establish Engineering as a learned profession, with emphasis on professional *education* as an essential prerequisite. Registration is making it more and more difficult for men to get into the Profession through the backdoor route without an engineering education. In 1929, the New York State Registration law contained no requirement of education or examinations. Now both are written into the law. Moreover distinct recognition has been recorded for the approved colleges of engineering: The relative handicap imposed upon the non-graduate, in terms of the longer qualifying experience required, has been progressively increased from two years to eight years. Finally, the examinations are such as virtually to bar those without proper professional education. The educators have tacitly accepted these advantages, but have shown little recognition or cooperation in return.

Recent graduates, facing Registration problems, have asked me: "Why were we told nothing about Registration at college?" I could give no answer. I do not know why there should be an apparent conspiracy of silence or ignorance. An educator is sadly remiss in his duty to his graduating students if he does not inform them of the established requirements for securing admission to the Profession. The young graduate may be seriously handicapped if he lacks such information and guidance for the proper planning of the apprenticeship experience and the continued post-collegiate study required to round out his professional training and to qualify him for Registration.

Individual educators have retarded progress in developing the examination standards for Engineers' Registration by saying to the Boards of Examiners: "We do not want you to re-examine our graduates!" They protest when examinations are included in subjects that are given in their curricula, and they protest again when examinations are included in subjects not covered in their curricula. It is difficult to understand why an educator should object to an impartial objective comparative test of his graduates with those of other institutions or with candidates who have not had the advantage of a college education. It is still more difficult to understand why an educator should object to examinations that test a candidate's knowledge matured and ripened by experience and supplemented by continued self-education four or more years after graduation. In the other established professions, as Medicine and Law, opposition by educators to extended qualifying examinations for licensure would be unthinkable. For Engineers' Registration, the State wants to test the candidate's knowledge and attainments at the time of professional certification, and is not satisfied to accept varying undergraduate class-room ratings antedating graduation as an equivalent substitute.

Despite the generally recognized narrowness or other defects of certain approved curricula, the Registration Boards are *not* "telling the educators what to teach." They are, however, expecting the graduates of these

schools to make up for any shortcomings or limitations in their education by further study after graduation. Surely the educators cannot quarrel with this principle. On the other hand, the teachers should not seek to tell the Registration Boards what examinations to give. Mutual cooperation and counsel are desired, but dictation is out of place. The Board of Examiners is entrusted with a serious responsibility by the State, and cannot delegate that responsibility to others.

2. The engineering schools have built up a confusing, chaotic and inconsistent system of engineering degrees to which they are tenaciously clinging. A count of the individual listings in the New York State roster reveals 86 different degrees held by the registered Professional Engineers, (with not all degrees recorded); and some 57 of these varieties are first degrees in engineering!

At a conference in 1932 of representatives of New York State engineering schools and colleges, called by the State Department of Education, Dr. Harlan H. Horner, Assistant Commissioner for Higher and Professional Education, presented a study showing that 42 *different* engineering degrees (18 authorized and 24 unauthorized) were being conferred by the 11 institutions in the State; that, for a *single branch* of engineering, six different titles or varieties were used for the first or Bachelor's degree; and that the Professional degree (as C.E., E.E., M.E.) meant three different things in different institutions, being conferred at the end of the fourth year in some of the schools, at the end of the fifth year, as a second degree, in other schools, and after a period of experience in the field by other institutions. In the discussions that followed, when the suggestion was made that the Professional degree be abandoned as a "degree in course" (that is, as a degree given upon graduation), one of the eminent educators exclaimed "Only over my dead body!" A committee of five Deans was appointed to study the problem, and their report presented the following year recommended a simplifying standardization of engineering degrees to the forms B.C.E., M.C.E., and D.C.E. for the first, second and third degrees, respectively, with the elimination of the Professional degree of the form C.E. This report was approved. I am happy to record the fact that the eminent educator who had been so strenuous in his protests the year before was the first to record his sincere retraction, also (before his death) the first to carry out in good faith the agreement reached to replace the Professional degree with the Bachelor's degree, although it meant the abandonment of a 100-year tradition for his institution. I am sorry to state that two of the institutions in New York State have not kept the faith, continuing to give the Professional degree, despite the fact that their Deans were leading members of the Committee of five that recommended the abandonment of that degree. Alumni sentiment is generally given as the excuse; nothing is said of the competitive value of continuing to give a more alluring degree after competing institutions have honorably discontinued its use.

The recent ballot of the Society for the Promotion of Engineering Education shows crystallization of opinion on this question. An 81 per cent vote was recorded in favor of standardizing the degrees earned in course to the types B.C.E., M.C.E., and D.C.E., for the first, second and third degrees, respectively. This is identical with the recommendation made and adopted in 1933 by the New York State Committee of Deans. In addition the S.P.E.E. ballot showed a 61 per cent vote for the complete discontinuance of the Professional degrees (of the type C.E.) both as earned and as honorary (or post-experience) degrees. It will be interesting to see to what extent the engineering schools will carry out these recommendations.

At the 1932 Conference of Educators in New York, I suggested that we should go further and make the first degree simply B.E. (Bachelor of Engineering) on the ground that there can not or should not be enough specialization or differentiation in the first four years of an Engineering course to justify specialized degrees. Subsequently, the same suggestion was independently made by President Butler of Columbia University, and Yale has recently adopted it. A number of schools are already following this practice, but evidently S.P.E.E. cannot see that far ahead.

The evolution of the Bachelor's degree in engineering is indicated in three successive simplifying phases: first, the form B.S.C.E., now the form B.C.E., and ultimately the form B.E. The first form, although cumbersome, was tempting to students, because it appeared or could be made to appear like two degrees. In 1920, after the second form had come into use, an S.P.E.E. report recommended the first form. In 1936, after the second form has been generally established and thought and usage have been directed to the third form, S.P.E.E. recommends the second. It will probably take another sixteen years for S.P.E.E. to catch up with present thought. Instead of looking ahead and leading the way, S. P. E. E. appears content to follow progress after it is recorded.

The matter of degrees has a professional significance. Any school continuing to give the Professional degree (of the form C.E.) to young men before they reach professional status is interfering with the proper functioning and signficance of the State Registration Laws. The schools should refrain from telling the young graduate, by a degree conferred upon him, that he is a "Civil Engineer" or a "Mechanical Engineer" when the Profession maintains and the law declares that the young man is not yet an "Engineer," and that he requires further training and preparation to qualify him for professional status. In a State with an effective Registration Law, no man is an Engineer unless and until he is Registered. In New York, a man with a C.E. degree was convicted for printing "Civil Engineer" on his letterhead before he was licensed. The practice of conferring such degrees has been generally abandoned. The continuance of that practice, in a few schools, subjects the graduate to possible embarrassment, contributes to the confusion of the public, and is in conflict with the spirit and the aspirations of the Engineers' Registration movement.

If any schools wish to use the Professional degree as an honorary degree, to be granted to former graduates after years of experience in the field of practice, it should not be conferred until the candidate has reached professional status, as evidenced by Registration. Not until then can he properly be called an Engineer. He should not be labelled a "Mechanical Engineer" or an "Electrical Engineer" until he has legally been admitted into the Engineering Profession.

Any school that fights this principle is clinging to selfish advantage while retarding the progress of the Profession.

3. During the past year, the thunder of all the guns in S.P.E.E. has been directed against me for an article (published in the *American Engineer*, February, 1934)

entitled "Engineers and Unemployment—Are Colleges Contributing Too Many Engineering Graduates?"

Here are the facts: In the forty years from 1890 to 1930, the number of living engineering graduates in the United States increased from 2,000 to 158,000; the number of students enrolled in the engineering schools increased from 1,195 to 73,386; and the number of engineering students annually graduated increased from 189 to 11,595. The engineering student enrollment increased 6,000 per cent and the number of living engineering graduates increased 7,800 per cent, while the population of the United States increased only 95 per cent. A generation ago there was a virtual vacuum to be filled, with only 2,000 living engineering graduates available to meet a demand for 32,000 Engineers in industry and construction in a period of rapid industrial development and growth. The educational machinery was then speeded up to meet the demand, but it has continued to be geared to that high accelerating speed even after the vacuum has been filled. Unless the engineering schools reduce their past rate of output, which was geared to a period of abnormal growth, there will be an increasingly large surplus of engineering graduates which the Profession will be unable to absorb. Many of the graduates will be unable to gain a foothold or to retain it in the economic competition.

Other professions have met this problem before us. Commencing in 1904, the Medical Profession, under the leadership and vision of its eminent and inspired educators, proceeded to apply the necessary remedial measures. The number of approved medical colleges in the United States was reduced from 162 to 76; the number of medical students was reduced (in fifteen years) from 26,147 to 13,798; and the number of graduates turned out annually was reduced from 5,606 to 2,656. During the past thirty years, the number of physicians per million of population was reduced 26 per cent, the number of lawyers was reduced 13 per cent, the number of architects was kept constant, while the number of Engineers *increased* 278 per cent. A comparative graph for these four professions emphasizes the control or reduction of ratios to population for the other three professions, while the ratio of Engineers is steeply ascending.

It is now practically impossible to enter a medical school without first completing at least two years, generally three or four, in a college of liberal arts. In 43 of the States, the premedical college study before admission to a medical school is required by law. After this preparation, out of some 30,000 applications received annually for admission to the medical schools, representing 12,000 to 14,000 qualified applicants, only about 6,300 are accepted and enrolled. (In 36 of the States, none but graduates of approved medical schools can be admitted into the profession.)

Contrast this program with conditions in the Engineering Profession, where most of the Engineering schools do everything they can to attract the boys in the high schools and all applicants are welcomed. Any high school graduate can easily secure admission in almost any Engineering school, and all who apply are admitted without regard to Engineering qualifications or aptitude.

To maintain a constant ratio of Engineers to population, allowing for retirement, mortality, and population growth, the total number of students in the Engineering schools should be 35,000 instead of 70,000, the number admitted annually to the freshman class should be 13,000 instead of 27,000, and the number graduated annually should be 5,000 instead of the present rate of 11,000.

Despite this indication of a critical necessity to curb enrollment, there are Engineering educators who continue to lure high school boys with the dramatized fascinations of an Engineering career and an optimistic picture of a shortage of trained Engineers.

Against any conclusion of overcrowding, these educators proudly advertise that 70, 80, or 90 per cent of their recent engineering graduates have secured employment. They do not, as a rule, state what kind of employment. A recent report analyzes the figures for a typical school and reveals the fact that, three or four years after graduation, only 42 per cent were engaged in engineering work; another 42 per cent had non-engineering jobs (including unskilled labor, and work as mechanics, bookkeepers, and salesmen); and 16 per cent had been unable to secure any work at all.

The educators, in their arguments and propaganda, use the catch phrase "Engineering is a culture as well as a career." Ask the 58 per cent of the recent graduates who have been unable to find engineering jobs about the cultural value of their engineering education. Ask the educators how many of their students are enrolled in Engineering merely as a culture without intending to follow it as a career. The answer would be negligible or nil. The fact remains that probably 99.9 per cent of the enrolled engineering students have chosen Engineering as their Profession and, when they graduate, they are added to the competitive struggle for engineering employment. Half of them will fail and will be forced to enter other occupations, but until they give up their struggle they constitute an addition to the competitive oversupply tending to depress the economic standards of the Profession. There are plenty of recent graduates begging for jobs in engineering offices, even without salary.

These are cold, hard facts. No amount of eloquent phrase-making can change them.

One educator attacks the idea of "ploughing under" future Engineers. The surplus of engineering graduates are not future Engineers. They are now "ploughed under," after graduation, by ruthless economic forces. It would have been elementary human charity to let them face the hard fact before enrollment instead of after graduation and to divert them to other callings before they devoted the four best years of their lives to study for a Profession which they will never practice. We are proposing that educational selection, by educators, before enrollment be substituted for the present more cruel and fortuitous natural selection, after graduation, by the blind struggle for economic survival.

Sixty per cent of the students who enter our engineering colleges fail to graduate. Is not this equally a "ploughing under" of future Engineers? One educator admits: "A number of poor students manage to struggle along in classes of capable students and finally pull through and are offered to the world as "engineers." Then is selection a heresy and are the acceptance and graduation of the incapable a virtue?

Another educator eloquently declares that "No boy with a God-given desire and ability to become an Engineer should be denied the opportunity." No one is proposing that any boy thus divinely qualified should be kept out. Any boy with a "God-given desire" will find

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BOARD OF DIRECTORS

Meeting—July 24th, 1936

Proposes Constitutional Amendments

Minutes Prepared by Secretary Conlon

THE eighth meeting of the Board of Directors of the National Society of Professional Engineers having been regularly called by President Steinman on July 7th, was duly held on July 24th, at the headquarters of the New York State Society of Professional Engineers, Grand Central Terminal Building, New York City. The meeting was called to order by President Steinman at 10 A. M.

The officers and directors present were:
Engineer D. B. Steinman, N. Y.
Engineer A. V. Sheridan, N. Y.
Engineer J. W. Dunham, D. C.
Engineer S. I. Sacks, Penn.
Engineer W. S. Conlon, D. C.

The order of business and action taken was as follows:

1.—Communications

(*a*) A letter from the Oklahoma Society of Professional Engineers, dated July 20th, addressed to the Secretary, was presented to the Board for consideration.

(*b*) A financial statement covering the period from January 1st, 1936, to June 30th, 1936, was presented to the Board by the Executive Secretary.

(*c*) Bids on printing the American Engineer were presented to the Board.

2.—Engineer J. W. Dunham, President of the District of Columbia Society of Professional Engineers, presented to the Board a statement outlining the action required and later taken in the form of resolutions as a means of placing the organization on a more business like basis.

2a. American Engineer—The manager of the American Engineer recommended the consolidation of the July and August, 1936, issues of the American Engineer.

On a motion by Engineer A. V. Sheridan, seconded by Engineer J. W. Dunham, the following resolution was adopted:

Resolved: That the Board of Directors hereby approve of the consolidation of the July and August issues of the American Engineer.

3.—Constitution Requirements

The following resolution was presented by Engineer J. W. Dunham, seconded by Engineer A. V. Sheridan, and adopted:

Resolved, by the Board of Directors: That in the furtherance of and compliance with, the specifications of the Constitution it is deemed desirable that a uniform plan of procedure with regard to admittance of state societies to membership be adopted and that such procedure be established as a condition for admission of all new state societies, and further that an outline of such procedure be submitted to all existing state societies for their consideration and adoption in order that uniform records of acceptance of the Constitution of N.S.P.E. by affiliated societies may be of record.

Therefore, be it further *Resolved*: That the following specifications are hereby adopted by the Board of Directors as a condition for admittance to membership in this Society, and it is hereby recommended to all affiliated state societies to the end that the matter of compliance therewith become effective at as early a date as possible.

Constitution—Changes Proposed

Proposed Change Number One, 1936:

The following resolution was presented by Engineer A. V. Sheridan, seconded by Engineer J. W. Dunham, and adopted:

Resolved by the Board of Directors: That whereas the limiting date for acceptance of State Societies of Professional Engineers to membership in this Society will effect a hardship on those state societies located in states wherein engineering license laws have not yet been adopted, it is deemed advisable to recommend to the membership of the Society through letter ballot printed in the American Engineer, July-August issue, 1936, certain changes in the Constitution. These changes in the Constitution are proposed in the MEMBERSHIP CHAPTER, Section (*b*), *which now reads as follows*:

"(*b*) in states not yet having registration laws, as Engineers who are legally registered in another State, or certified by the National Council of State Boards of Engineering Examiners, or, up to January 1, 1937, by the Board of Directors of a constituent or cooperating organization as having equivalent qualifications. After January 1st, 1937, members who have secured admission through certification by a Board of Directors of a constituent or cooperating organization shall be dropped from membership unless they shall have otherwise qualified as herein set forth." (Note: Words underscored will be deleted.)

(*b*) *As it will read:*

"(*b*) in states not yet having registration laws, as Engineers who are legally registered in another State, or certified by the National Council of State Boards of Engineering Examiners, or, by the Board of Directors of a constituent or cooperating organization as having equivalent qualifications. WITHIN TWO YEARS AFTER THE ENACTMENT OF A REGISTRATION LAW IN SUCH STATE members who have secured admission through certification by a Board of Directors of a constituent or cooperating organization shall be dropped from membership unless they shall have otherwise qualified as herein set forth." (Note: Words in capitals are new.)

Proposed Change Number Two, 1936:

The following resolution was presented by Engineer

(*Continued on page* 20)

AMENDMENTS TO CONSTITUTION

of

The National Society of Professional Engineers

Proposed by Board of Directors

(Vote to be tabulated August 30th. Members are urged to return ballot at once.)

AT THE meeting of the Board of Directors of the National Society of Professional Engineers on July 24th, it was unanimously voted to recommend the adoption of two amendments to the Constitution of the Society and to submit them to the vote of the membership by this Letter Ballot.

(Matter in italics is new. Matter in brackets is to be eliminated.)

Amendment No. 1

In order to help the State Societies that have not yet succeeded in securing the enactment of Engineers' Registration Laws, it is proposed to eliminate the time limitation of January 1st, 1937, and accordingly to amend the Article on Membership to read as follows:

Membership — The membership shall be limited to Professional Engineers. Professional Engineers shall be defined (a) in states having registration laws, as engineers who are legally registered or licensed; (b) in states not yet having registration laws, as engineers who are legally registered in another state, or certified by the National Council of State Boards of Engineering Examiners, or [, up to January 1st, 1937,] by the Board of Directors of a constituent or cooperating organization as having equivalent qualifications. [After January 1st, 1937] *Within two years after the enactment of an Engineers' Registration Law in such State,* members who have secured admission through certification by a board of directors of a constituent or cooperating organization shall be dropped from membership unless they shall have otherwise qualified as herein set forth.

Amendment No. 2

For increased effectiveness, representation, and recognition, it is proposed to enlarge the official personnel of the National Society by increasing the number of Vice-Presidents from two to four, and accordingly to amend the Article on Officers to read as follows:

Officers—The officers of the National Society shall be a President, [two (2)] *four (4)* Vice-Presidents, a Treasurer, and a salaried Executive Secretary, who shall each perform the duties usually pertaining to the respective offices.

Important Note

For the timely guidance of the Nominating Committee, which has already been appointed, prompt action on these amendments is required. The closing date for receiving these Letter Ballots has been set for August 30th. Use the ballot form printed below and mail it promptly to Engr. Willard S. Conlon, Executive Secretary, N.S.P.E., National Press Building, Washington, D. C.

Detach Here

LETTER BALLOT ON AMENDMENTS

to the Constitution of the National Society of Professional Engineers.

Vote Here

Amendment No. 1..... Yes ☐ No ☐

Amendment No. 2..... Yes ☐ No ☐

Signed.....

Member N.S.P.E.

Detach and mail promptly (to be received before August 20, 1936) to National Society of Professional Engineers, National Press Building, Washington, D. C.

STATE SOCIETIES AND COUNTY CHAPTERS

Constitutional Requirements for Membership

In National Society of Professional Engineers

Approved
by
The Board of Directors
July 24, 1936

June 27, 1936.

Engr. Willard S. Conlon
National Press Building
Washington, D. C.

Dear Engr. Conlon:

Following the recommendation of the District of Columbia Society of Professional Engineers and other requests which I have received, I have prepared the enclosed draft entitled "Constitutional Requirements of State Societies and County Chapters." I have incorporated material which I included in my letter of March 4, 1936, to Engr. J. W. Beretta, with carbon copies to you and Engrs. Sheridan and Ford and six others, relative to a model Constitution for the Texas Society of Professional Engineers and its County Chapters.

I believe our Executive Committee should keep this list of constitutional requirements before it and require it as a minimum to be satisfied by any proposed State Society Constitution before that Constitution is approved and the State Society admitted to the National Society. I would also suggest that these constitutional requirements be brought to the attention of our present Member State Societies, with the recommendation that they amend their Constitutions if necessary in order to make them conform to these minimum requirements.

If all of the State Society and County Chapter Constitutions embodied the provisions which I have here written down, the entire organization would be more closely integrated, and many of our embarrassing problems with respect to dues and divided membership would be eliminated.

Faithfully yours,
D. B. STEINMAN.

Constitutional Requirements for State Societies and County Chapters

By D. B. Steinman.

Approved July 24, 1936. (See Minutes—Directors Meeting).

1. The following provisions should be incorporated in the Constitutions of all Member State Societies of the National Society of Professional Engineers:

Preamble: This Society subscribes to the aims and purposes as set forth in the Preamble, Constitution. and By-Laws of the National Society of Professional Engineers. In order to aid in advancing these ideals in the State of , this Society accepts a charter from the National Society, subscribes to the provisions of the National Society Constitution, and herewith sets forth its Constitution and By-Laws of which this Preamble is a part.

Article—Name: This Society is a member state society of the National Society of Professional Engineers and shall be known as the Society of Professional Engineers.

Article—Membership: The membership of this Society shall be limited to Professional Engineers, registered under the laws of this State. Every member of this Society is a member of the National Society of Professional Engineers.

Article—Dues: The dues of the Society shall be ( )* dollars per annum, due and payable at the beginning of the fiscal year on January first. These dues shall be apportioned as follows: ( ) dollars shall be retained by the State Society for its own activities and four dollars shall be transmitted to the National Society to cover National Society dues and subscription to the American Engineer.

Article—Chapters: This Society, through its Executive Board, may authorize and charter one chapter in each County or group of Counties of the State. Only registered Professional Engineers shall be admitted to membership in any County Chapter, and every member of a County Chapter shall be a member of the State Society and of the National Society.

2 *The following provisions should be incorporated in the Constitutions of all County Chapters of Member State Societies of the National Society of Professional Engineers*:

Preamble: This Chapter subscribes to the aims and purposes as set forth in the Preamble, Constitution and By-Laws of the (state) Society of Professional Engineers and of the National Society of Professional Engineers. In order to aid in advancing these ideals in the County of , this Chapter accepts a charter from the (State) Society of Professional Engineers, subscribes to the provisions of both the National Society and the State Society Constitutions, and herewith sets forth its Constitution and By-Laws of which this Preamble is a part.

Article—Name: This Chapter is a County Chapter of the (State) Society of Professional Engineers, which is a member state society of the National Society of Professional Engineers, and shall be known as the County Chapter of Professional Engineers.

Article—Membership: The membership of this Chapter shall be limited to Professional Engineers, registered under the laws of this State. Every member of this Chapter is a member of the (State) Society of Professional Engineers and of the National Society of Professional Engineers.

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ITEMS OF GENERAL INTEREST

REPORTS, NEWS, COMMENTS

STATE ACTIVITIES

Correspondents and readers are invited to submit for publication items of interest to the professional engineer of the country. Such material should be forwarded as quickly as possible in order to keep news up to date.

NO QUARREL WITH "OPERATING ENGINEERS"

By D. B. STEINMAN

The campaign of the engineering profession to restrict and protect, by legislative enactment, the use of the designation "engineer" is not directed or aimed at those who are popularly termed "engineers" because they operate locomotive, marine, or stationary engines. We should like to correct this confusing and conflicting application of the term "engineers", but we realize that this should be done by education and persuasion rather than by legislation.

Our legislative steps for the protection of our professional designation are aimed and directed at those others who misappropriate or misuse the appellation "engineer" in such manner as to mislead the public, degrade the designation, or injure the good name and standing of our profession. Other professions before us have found it necessary to secure legislation to protect their designations, and various professions have reached the conclusion that legal protection of the designation is even more important than legal protection of practice. This is for the safeguarding of the public as well as for the protection of the standards and the standing of the profession.

Without such legislation we cannot stop 1) those who mislead the public by appropriating the designation "engineer" in the professional sense, styling themselves as Electrical Engineers, Mining Engineers, Consulting Engineers, and the like, without professional education and qualifications; 2) those who are immature or incompetent but who seek to facilitate securing employment by styling themselves "engineers"; 3) those who are not engineers in any sense and whose work is not engineering but who seek to borrow standing from the engineering profession by styling themselves "Sales Engineers", "Efficiency Engineers", "Insurance Engineers", "Service Engineers", "Social Engineers", and the like, and 4) those who display hybrid designations that degrade the term "engineer" or expose it to ridicule, such as "Lawnmower Engineers", "Matrimonial Engineers", "Domestic Engineers", and "Exterminating Engineers".

Our legislation is aimed at those who assume the designation with professional pretensions to mislead or in such forms as to degrade it. We are not primarily concerned with those who use the term "engineer" honestly, without professional pretensions or connotation, in the sense of an "engine operator" or "engineman". We do urge and recommend the adoption and substitution of these clarifying terms for the misapplied designation "engineer", and we have already made considerable progress through voluntary cooperation. Although we are not initiating legislation to this end, we are consistently opposing any legislation that tends to establish or perpetuate such equivocal or confusing use of the term "engineer" in the non-professional sense.

EXAMINATION

LIEUTENANT, U. S. NAVY

Announcement for Examination for Appointment As Assistant Civil Engineer, With the Rank of Lieutenant (Junior Grade), United States Navy

1. EXAMINATION AND VACANCIES—The examination is to fill vacancies in the commissioned grade of assistant civil engineer, Corps of Civil Engineers, United States Navy, with rank of lieutenant (junior grade). Existing vacancies will be filled as soon as possible by the appointment of candidates successfully passing the examination; those successful candidates not immediately appointed will be placed on a waiting list for a period of not greater than 1 year, from which list appointments may be made to fill additional vacancies. The examinations will comprise:

First.—A preliminary (nonassembled) examination as to general fitness, based on collegiate record, statements of references, and professional experience. Candidates should submit their papers for this preliminary (nonassembled) examination by mail direct to the Chief of the Bureau of Yards and Docks, Navy Department, Washington, D. C. The data required should be inserted on the attached form A and forwarded at an early date. Forms received after September 15, 1936, cannot be considered.

Second.—A physical examination to be held in Washington, D. C., and at such other cities as the number of candidates in the region may justify, such as New York, Chicago, and San Francisco. This examination will immediately precede the written professional examination conducted by the Naval Examining Board at the same city as the physical examination. Only those candidates who are selected from those taking the preliminary (nonassembled) examination will be authorized to be examined physically. The date and locations of the physical examination will be announced after the rating of the papers in the preliminary (nonassembled) examination has been completed.

Third.—An oral and a written, profes-

(*Continued on page* 21)

PENNSYLVANIA

Proposal for Engineering Council Should Be Nipped in Bud

A movement purporting to create a Pennsylvania Engineering Council has been suggested by persons who are either unaware, or apprehensive, of the aims and purposes of the State Professional Society and of its orderly and effective development.

This is but an echo of a similar and unsuccessful attempt made in New York several years ago to weaken the position of its professional society. Members of the New York State Society openly opposed the proposal which, if carried into effect, would have destroyed, not the State Society but rather the technical societies who sponsored it. Most members of the professional societies belong to one or more of the technical organizations and wholesale resignations from the latter would have resulted if the proposal had not been quickly and definitely dropped.

There is no more need for such a heterogeneous group or body in Pennsylvania than there was in New York and every professional engineer should make it plain that any attempt to offset the magnificent progress and accomplishment made by the Pennsylvania Society of Professional Engineers would compel a choice between membership in those groups sponsoring the so-called Council or abandonment of a wholly unwarranted and questionable attempt to interfere with the activities of the professional body. The so-called Councils do not represent professional engineers and do not have the status, the viewpoint, the understanding or the idealism essential to a professional body.

To quote a recent statement from National President Steinman to Executive Secretary Battin:

"You are absolutely right in your letter of June 16th, recording your opposition to the idea of setting up a Pennsylvania Engineering Council made up of representatives from the various local state technical engineering societies. The State Society of Professional Engineers should have nothing to do with any such organization, and should in fact oppose it.

"In the past the formation of such state engineering councils has been sponsored as a move to kill State Societies of Professional Engineers or to prevent their formation, and certain interests are still pursuing the same tactics. The same issue arose in New York State several years ago and it required vigorous and energetic action by the State Society of Professional Engineers to stop the movement."

The Pennsylvania Society is a recognized professional organization with aims, standards and objectives immeasurably above those of any conglomerate council.

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CONNECTICUT

Holds Engineering Congress

More than 300 engineers, in addition to civic workers and public officials, attended an Engineering Congress held in Bridgeport on July 25th. The program which began at 10:00 A. M. carried on without interruption for more than twelve hours.

At the noon-day session distinguished representatives from various fields of activity incidental to engineering addressed the audience. At the evening session, which included a dinner, additional addresses were delivered by prominent representatives of the Federal Government.

The program follows:

OFFICIAL PROGRAM

CONNECTICUT ENGINEERING CONGRESS

July 25th, 1936

The Connecticut Society of Professional Engineers, Incorporated

The Engineers Club
Of Bridgeport

American Society of Mechanical Engineers
Bridgeport Section

Stratfield Hotel
Bridgeport
Conn.

FOREWORD

To All Participants in the

CONNECTICUT ENGINEERING CONGRESS

Bridgeport
July 25th, 1936

This event is unique and historical in that:—

Never before have the ENGINEERS put on a State Program of such significance to the public well being and concern;

This is an Engineering Convention to present serious national and state problems to the layman as well as the Engineering Profession;

It is the first state wide Connecticut Engineering Conference jointly sponsored by Professional, Technical, Educational and Social organizations of Engineers, and joined in by all classifications of engineers;

It marks the debut of the Registered Engineers, the representatives of the profession of engineering now legalized in all its branches by the enactment of the Engineer's Registration Law in Connecticut;

It exemplifies the desire of the Profession to serve the Nation in acquainting the thinking public with dangers that affect their common weal, their future, and their country, emulating that other great factor for the public good, the Medical Profession, whose efforts against contagion, contamination and early death are universally recognized;

This is the first time that so many speakers of such national and international reputation as premier authorities upon the subjects of which they speak have been brought to the State of Connecticut on one program;

This is the first of a projected annual series of Engineering Congresses to be held in the State of Connecticut to unite the engineers and the people whom they serve in a non-political, non-technical, non-subsidized discussion of vital matters of common interest;

To those of you who join in these activities and benefit thereby, and to your friends, the Engineering Bodies sponsoring this Congress tender a cordial invitation to attend next year's Congress at whatever place in the state is chosen.

Get your reservation in early for preferred seats.

The cost for the entire CONGRESS including registration, luncheon, dinner and entertainment is $3.00.

For those who cannot arrive at 12:00 for the luncheon, the cost is $2.00 for the Dinner.

Registration alone is 75 cents.

Come as early as you can.

PROGRAM

(Eastern Daylight Saving Time)

REGISTRATION—Opens 10:30 A.M. Secure Reservations at Committee Desk.

RECEPTION—10:30 A.M. to 12:00 A.M. Introductions and Reception—Hotel Lounge.

Come right in and make yourself at home. T. J. Russell and his staff on the Reception Committee will do their best to make you happy.

NOON DAY SESSION

12:00 to 3:00 P.M.

(Don't forget your reservation)

LUNCHEON—12:00 to 1:00 P.M.—Vocal Solos by Wanda Goll—The pensive Lady of Radio and Night Club fame. Accompanied by Lou Weiss, the Ivory Tickler. Both are with the Pine Room of the Stratfield Hotel.

ADDRESSES—1:00 to 3.00 P.M.

HARRY E. HARRIS—General Chairman, Connecticut Engineering Congress. Chairman, National Engineering Committee on Flood Control and Soil Conservation; President, Connecticut Society of Professional Engineers; Past President, Engineers Club of Bridgeport; Past Chairman, Bridgeport Section, American Society of Mechanical Engineers.

JASPER McLEVY—Welcome. Mayor of the City of Bridgeport.

HARRY R. WESTCOTT — Toastmaster. Vice-President, American Society of Mechanical Engineers; Chairman, Committee on Policies and Budget, American Society of Mechanical Engineers; Structural and Power Plant Engineer; Chairman, New Haven Machine Tool Exhibitions.

IGOR I. SIKORSKY—"Commercial Aerial Trans-Oceanic Transportation with Heavier-than-Air Craft." Chief Aeronautical Engineer, Sikorsky Aviation Co.; Pioneer Aviation expert; Designer of Pan American Clipper Amphibians; Founder President, Sikorsky Manufacturing Corporation.

ROLAND B. RESPESS—"Commercial Aerial Trans-Oceanic Transportation with Dirigible Air Ships." President, Respess Aeronautical Engineering Corporation; inventor and Designer of Suspension Bridge Type Frame Dirigibles.

DAVID B. STEINMAN—"The Engineer's Contribution to Progress." President, National Society of Professional Engineers; Robinson & Steinman, Structural and Bridge Engineering Corporation; Designer of some of the World's most notable bridges; Past President, National Council of State Boards of Engineering Examiners.

ALBERT N. JORGENSEN—"Connecticut State Engineering Problems." President of Connecticut State College; Associate Director of Bureau of Research, State University of Iowa 1922-1925; Director of Educational Administration, Michigan State College 1927-1931; Professor of Educational Administration, University of Buffalo 1931-35.

AFTERNOON SESSION

3:00 to 5:30 P.M.

FLOOD CONTROL AND SOIL CONSERVATION PROGRAM in Central High School Auditorium. Dudley B. Bullard, Chairman.

ADDRESSES:

MR. ROLAND B. RESPESS—"Building American Dirigibles."

Dr. DAVID B. STEINMAN—"The Engineer's Duty in Public Matters."

COL. MASON J. YOUNG—"Flood Devastation in Connecticut" with Lantern Slides.

PROF. THORNDIKE SAVILLE—"Protection Against the Flood Menace." Hydrologist, Water Resources Committee; Consultant on Drainage, Sanitation, and Waterworks; Author of many books on Water Supply Power and Control; Associate Dean, College of Engineering, New York University; Official Representative, the Department of Agriculture.

DUDLEY HARMON—"New England's Part in Flood Prevention." Vice-President, New England Council.

ARTHUR V. SHERIDAN—"How the Professional Engineer Can Help." Editor in Chief, American Engineer; Chief Engineer of the Borough of the Bronx; Chairman, Publications Committee, National Society of Professional Engineers.

SIMULTANEOUS EVENTS

3:00 to 5:30 P.M.

Register at Committee Desk.

LADIES' TEA AND CARD PARTY.

THE FINISH OF THE SOAP BOX DERBY.

Charles H. Merritt, Chairman of the Entertainment Committee assisted by Thomas J. Russell, Chairman of the Reception Committee, E. Payson Blanchard, Chairman of the Transportation Committee, and William Parker Little, Chairman of the Ladies' Entertainment Committee will be on hand at the Committee desk with their Committees at 3.00 P.M. to assist you in attending either event that you select.

EVENING SESSION

5:30 to 10:00 P.M.

DINNER (Informal)—5:30 to 6:30 P.M.

SONG AND MELODY—

Miss Edna Altieri—Mezzo Soprano—Pupil of Maestro Luigi Mainiero.

Charles A. Mertens—Baritone Radio Soloist—President, Rotary File Company.

Prof. William Wiedenhammer—Concert Pianist—Formerly with Frank Damrosch, Conductor.

The Handel Double Quartet—Erich Lorsch, Fritz Brehm, tenors; Carl Boes, Hans Schwarz, second tenors; Henry Kaeller, Ernest Simon, first basses; Otto Riep, Gustav Riep, second basses; Prof. Fritz K. G. Weber, director.

ADDRESSES—6:30 to 10:00 P.M.

Arthur V. Sheridan, toastmaster.

Mason J. Young, "Flood Conditions in Connecticut." Illustrated with Lantern Slides. Lieutenant Colonel, United States Army Engineers; in charge of flood investigations in New England; official representative of the War Department.

Hugh Hammond Bennett, "Soil Conservation and Water Control." Chairman, Washington Conference of Up-Stream Engineering; Chief, Soil Conservation Service, United States Department of Agriculture; Chemical Engineer, Scientist and Explorer; Captain Engineers, United States Army; Author of many scientific works on Soil and Agriculture; Leader and Member of Explorations and Surveys Relating to the Soil, Products and Economics in South America, Centra America, Alaska, Cuba, Canal Zone and the United States; Official Representative of the Department of Agriculture.

Earle H. Clapp, "Reforestation as an Aid to Flood Prevention." Associate Chief and Research Scientist of the United States Forest Service, Department of Agriculture; Author of Many Scientific Works on Forestry, Lumber Economics, Timber Crops, Future Requirement of the United States; Official presentative of the Forest Service.

SPONSORS AND COMMITTEES

The Engineering Bodies Directly Supporting This Program Are: The Connecticut Society of Professional Engineers, Incorporated; the American Society of Mechanical Engineers, Bridgeport Section; the Engineers Club of Bridgeport, Incorporated. The work has been carried out by a JOINT ENGINEERING COMMITTEE appointed by the SPONSOR ENGINEERING SOCIETIES.

The duties were subdivided among the following committees:

Executive Committee: Harry E. Harris, chairman; William P. Little, Herbert E. Wells, treasurer; Albert W. Hagan, Edwin Moss, George C. Thomas, Milton Marks, H. Patterson Harris, Carl Gotthardt, secretary; Charles H. Merritt, William H. Sniffen, Julius Brenzinger, Thomas J. Russell, John W. Shallenberger.

Honorary members of joint engineering committee: W. B. Aurandt, honorary chairman; Mr. Dudley Harmon, Mr. Leonard Asheim, Engineer Edwin J. Beugler, Engineer Joseph W. Cone, Mr. Milton H. Friedberg, Engineer John W. Kmetzo, Engineer J. Gerald Phelan, Engineer Arthur Sheridan, Mr. Dwight C. Wheeler, Mr. James L. McGovern, Engineer Arthur Brewer, Engineer Ernest B. Crocker, Engineer Elbert S. Overbaugh, Engineer E. P. Bullard, Engineer O. Frederick Westerberg, Engineer William H. Hughes, Engineer Chester S. Wendell, Engineer John L. Harkness, Engineer Donald S. Sammis, Engineer Joseph O. Kelly, Engineer Claude T. Wilson, Mr. Robert A. Crosby, Mr. William C. Meehan, Rev. Rabbi Albert L. Martin, Mr. Gilbert F. White, Mr. John B. Banthin, Mr. Edward T. Buckingham, Prof. William J. Cox, Dr. R. H. Lockhardt, Mr. Charles W. Whittlesey, Mr. George C. Waldo, Engineer W. Stewart Clark, Engineer John H. Van Yorx.

Engineer Robert Van Horn, Engineer Charles J. McClinch, Engineer Willard S. Conlon, Engineer Edward Borggrafe, Engineer Herbert C. Elton, Engineer Elmer H. Beard, Engineer Walter B. Dunbar, Mr. Louis F. Oneker, Rev. Dr. Wilnam Horace Day, Senator Albert E. Eccles, Mr. Wallace M. Bayliss, Mr. David A. Clark, Dr. Samuel W. Dudley, Prof. C. R. Hoover, Judge Paul L. Miller, Engineer Berton Shook, Mr. Worcester Warren, Dr. E. E. Cortright, Engineer W. R. Clark, Col. James D. Skinner, Engineer John Chasman, Engineer William R. Webster, Engineer T. H. Beard, Engineer John G. Hughes, Engineer Z. F. Cappabianca, Engineer Arthur A. Mitchell, Engineer George Bilderbeck, Engineer Leon E. Tuttle, Dr. R. W. Johnson, Senator Albert E. Lavery, Engineer George P. Thompson, Rev. Father Stephen F. Chernitzky.

Afternoon Session Committee: Dudley B. Bullard, chairman; Charles H. Merritt, John A. Bullard, William H. Sniffen, Leslie A. Hoffman, Joseph H. Bentley, Herbert C. Elton, Charles J. McClinch, Cecil N. Hoagland.

Registration and Reservations Committee: H. E. Wells, chairman; George C. Thomas, Fred Miller, Carl Gotthardt, secretary; William H. Sniffen.

Transportation Committee: E. Payson Blanchard, chairman; Albert W. Hagan, Leslie A. Hoffman, John W. Shallenberger.

Publicity Committee: Harry E. Harris, chairman; W. B. Aurandt, J. W. Shallenberger, William H. Sniffen, Carl Gotthardt, Charles F. Schmelz.

Reception Committee: Thomas J. Russell, chairman; C. C. Smith, Max Davis, C. N. Hoagland, C. J. Berner.

Entertainment Committee: Charles H. Merritt, chairman; Oscar J. Richmond, Julius Brenzinger, L. Medvey, Albert W. Hagan, E. Payson Blanchard.

Ladies Reception and Entertainment Committee: William P. Little, chairman, E. Payson Blanchard, vice-chairman; George C. Thomas, W. B. Aurandt, Charles Cyrus, Earl G. Eisenman.

Program and Speakers Committee: Harry E. Harris, chairman; Milton Marks, Herbert E. Wells, Albert W. Hagan, Edwin Moss, Carl Gotthardt.

Printing and Mailing Committee: Carl Gotthardt, chairman; William H. Sniffen, James R. Macintyre, William P. Little, F. H. Travers, Milton Marks, Charles H. Merritt.

A NOTE OF APPRECIATION

The Joint Engineering Committee has made its best effort to make this meeting of interest to everyone, and it has been extremely fortunate in obtaining speakers of great prominence.

We wish to thank the busy officials, engineers, and scientists, who have consented to make this program distinguished through their able addresses.

We appreciate the backing that the Sponsor Societies have given and acknowledge the help so cheerfully furnished by the several civic, educational, and technical groups, in selecting the list of those non-engineers who have been invited to participate.

We thank the Committee Members and the Honorary Members for the actual help and cheerful support they have given in this large undertaking.

We wish to express our appreciation of the efficient co-operation of the management of the Stratfield Hotel.

The valuable assistance given by the Board of Education of the City of Bridgeport in furnishing the Central High School Auditorium for the Afternoon Session has been a most important factor.

The co-operative attitude of the Bridgeport Centennial Committee is appreciated.

To the superior artists who contribute their talent in song and melody at the Luncheon and Dinner, we are grateful.

The Bridgeport Post and Telegram and the Bridgeport Times-Star have been most considerate and helpful.

The help of the Bridgeport Chamber of Commerce is appreciated.

And last of all, we wish to sincerely thank you all for seconding our efforts by your attendance and interest, and by the public support that you can give these important matters affecting your nation.

THE JOINT EXECUTIVE COMMITTEE.

OKLAHOMA

Society Active

Reports received from Secretary Lashbrook of Oklahoma Society indicate a consistent growth of the paid-up membership in the National body.

Advocates National Mapping Plan

The following resolution has been forwarded to the National Society and to legislators of the State:

WHEREAS, a National Mapping Plan has been formulated by a special committee of the National Resource Board, looking toward the complete mapping of the nation, and

WHEREAS, control surveys must necessarily proceed detailed surveys and mapping, and

WHEREAS, control surveys will greatly facilitate investigation and coordinated development of conservation and flood control projects which are now in process of investigation and development, as well as other public and private enterprises, and

WHEREAS, control surveys may be utilized to afford a measure of relief from unemployment in a group of the citizenship not readily reached by other relief measures, now be it

RESOLVED, by the Board of Directors of the Oklahoma Society of Professional Engineers in special meeting assembled at Oklahoma City this 10th day of May 1936, that this Society does respectfully urge the active support by each Senator and Representative from Oklahoma, of a bill (similar to that hereto attached*) to be introduced in the Congress and providing for the completion of the twenty-five-mile spacing of horizontal and vertical control surveys in the State of Oklahoma, and be it further

RESOLVED, that this Society does respectfully request that each Senator and Representative from Oklahoma lend active and persistent support to legislation activating the recommendations of the National Resource Board pertaining to this mapping problem, to the end that detailed mapping of the nation be produced by the regularly constituted governmental department normally charged with this function as rapidly as may be consistent with public policy and public economy.

* Not enclosed.

OHIO

Engineer Nominations

The publication in the June issue of the names of the various candidates for County Engineer throughout Ohio has brought to the American Engineer numerous expressions of favorable comment from persons outside the State. Perhaps the practice should be amplified and extended.

Society Commended

The following, prepared for the June Bulletin of the Ohio Society, is worth nationwide notice:

A MESSAGE

To the Professional Engineers of Ohio from Engr. D. B. Steinman, President, National Society of Professional Engineers

The Ohio Society of Professional Engineers has won a position of national

(*Continued on page* 25)

TEXAS

Travis Chapter

Executive Secretary R. S. Guinn, of the Travis Chapter of the Texas Society of Professional Engineers, has advised that the Chapter has joined the procession of States that have supported the Connecticut Society in what is proving to be the biggest single endeavor in behalf of the public welfare that has ever been undertaken by the engineering profession. When Texas, Connecticut, Pennsylvania, Carolina, New York, Kentucky, Ohio, et al, join hands professionally it is a welcome and significant sign.

Resolution on Flood Control

WHEREAS, the appalling loss of life, health, property and injury to the economic welfare of the nation and its people from the preventable devastation caused by uncontrolled flood conditions throughout the land can repeatedly occur with progressive aggravation under the present condition of our natural water sheds, as illustrated by the successive floods in Texas and in the southwest which have come at intervals of approximately seven (7) years throughout the last third of a century; and

WHEREAS, such flood conditions usually extend over large areas extending throughout several states, thus making them a National problem instead of a state problem; and

WHEREAS, the magnitude of the losses caused by the aforesaid flood conditions is due to extensive expansion of our civilization and development of industries in the larger basins, without due regard to the natural laws governing the probable occurrence of flood conditions, and the general lack of unified flood control measures covering drainage basins as a whole; and

WHEREAS, the correction of the conditions contributing to the aforesaid calamities is an engineering problem and can be eliminated entirely or alleviated to a great extent by a comprehensive engineering study of conditions in the several drainage basins, together with the planning and construction of the necessary reservoirs, dams, levees or other protective works; and

WHEREAS, such reservoirs, dams, levees and other protective works will alter the regimen of the several streams in such a way as to augment the available water supply for domestic use, crop production, and power development, as well as create pleasure parks and otherwise provide benefits to our ever-growing population; and

WHEREAS, corrective work carried out in stricken localities at times immediately following disastrous floods may be hurriedly done, and lacks the coordination necessary to secure effective control of a given stream throughout its whole drainage area, and so result in future dangers and great waste.

THEREFORE, BE IT RESOLVED:

THAT THE TRAVIS CHAPTER OF THE TEXAS SOCIETY OF PROFESSIONAL ENGINEERS does hereby suggest and urge (1) that the several state governments and the Federal government combine to set up a UNIFIED ENGINEERING CONTROL for each drainage area, each reporting to a CENTRAL COORDINATING ENGINEERING AUTHORITY: (2) that funds be appro-

(*Continued on page* 25)

VIRGINIA

Society Elects Officers

The election of officers for the Virginia Society of Professional Engineers produced the following results:

For President, E. M. Hastings; Vice-President, F. J. Sette; Treasurer, W. W. Archer, Jr.

The Professional Engineers of Virginia are invited to address the Secretary, R. Cooper Bailey, whose address is: Box 112, Richmond, Va.

Proposed By-Laws

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Article VIII—Amendments

By-Laws

Article I

Fiscal Year

Section 1. The Fiscal Year of the State Society shall be from January first to December thirty-first.

Article II

Meetings

Section 1. Regular. The State Society shall regularly convene three times annually at the call of the President. Such meetings shall take place as follows: Once during the winter season, once during the spring season, and once during the autumn season. The location and date of these meetings shall be determined by the Executive Board.

Section 2. Special. Special meetings shall be called by the President at the request of the Executive Board, or upon the written request of twenty-five members, or may be called upon his own volition. The purpose of such meetings shall be set forth in the notice to members; and no business, other than that for which the meeting was called, shall be transacted.

Section 3. Annual Meeting. The winter meeting, generally held in January, shall be known as the Annual Meeting, at which newly elected officers shall be installed.

Section 4. Quorum. For the purpose of transacting the business of the State Society, a quorum shall consist of members, properly accredited, representing at least one-third of the chartered district chapters.

Section 5. Resolutions. At any meeting of the State Society all resolutions shall be presented by the President after each resolution bears the signature of ten members and sent or mailed to the State Headquarters at least three weeks prior to the meeting; provided, however, that matters presented less than three weeks prior to the meeting may be considered and acted upon with the specific consent of three-fourths of the delegate votes present.

Section 6. Order of Business. At any meeting of the State Society the following order will be observed, unless suspended for the time being by a two-thirds vote:

1. Reading of the Minutes.
2. Election of Members.
3. Reports of Committees.
4. Financial Report (only at Annual Meeting).

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NEW YORK

C. Eugene Bentley Passes
Beloved as Citizen and Engineer

C. Eugene Bentley, one of the best-known and most highly esteemed members of the State Society, died in Jamestown, New York, on July 28th. Born in 1856 he was one of the oldest surveyors in the country; he began his career in 1889 and was actively engaged in his practice until he became ill a month ago.

Mr. Bentley became a member of the State Society when it was in its infancy and constantly manifested a devotion to the advancement of the interests of his profession; he was a distinguished and faithful attendant at society meetings in all parts of the State.

The State Society has sent a telegram to the Chautauqua-Cattaraugus Counties Chapter, of which Mr. Bentley was a member, expressing the sympathy and sense of loss of the membership of the Society throughout the State.

New York State Board of Examiners

The 157th meeting of the New York State Board of Examiners of Professional Engineers was held in the rooms of the American Institute of Electrical Engineers and the American Society of Mechanical Engineers in New York City on July 22nd and 23rd, 1936. All five members of the Board were present.

In the two-day session, following previous review of the applications by the individual members of the Board, 57 applicants were personally interviewed and a total of 219 applications were considered. Of these, 40 were approved for license, 94 were scheduled for written examinations, 19 were held for further consideration, and 66 were rejected.

Approximately 1,000 candidates took the written examinations in June. The Board members are working on the marking of these papers, and announcement of the results may be expected by the end of August.

Bronx Architects and Engineers Cooperate

On June 19, 1936, an apartment house in the course of construction collapsed causing the death of eighteen persons. On June 24 representatives of the Bronx Society of Architects and the Bronx County Chapter of the New York State Society of Professional Engineers created a joint committee to be known as the Joint Committee of Professional Engineers and Architects to study and make recommendations for the strengthening and enforcement of state and municipal laws designed to safeguard life and property in the field of building construction.

The members of the joint committee are: Architects—Matthew W. Del Gaudio, Samuel J. Kessler, W. Koch, H. Nordheim; Engineers — George C. Diehl, Charles F. Giraud, Prof. Alexander Haring, Raphael J. Smyth. George J. Cavalieri, President of the Bronx Society of Architects, and Raymond J. Van Wagner, President of the Bronx County Chapter of Professional Engineers, are ex-officio members of the committee.

Opening of the Triborough Bridge

On July 11, 1936, the $60,000,000 Triborough Bridge, connecting the Boroughs of The Bronx, Manhattan and Queens, was officially opened with impressive ceremonies. Hon. Robert Moses, Secretary and Chief Executive Officer of the Triborough Bridge Authority was pre-

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FLOOD CONTROL

President Recognizes Engineers—From Pen of Engr. Harry E. Harris

The efforts of the Professional Engineering Societies and their various Flood Control and Legislative Committees to have the vital work of Soil Conservation, Reforestation and Flood Control coordinated and recognized as a huge project of a purely professional engineering character in its planning, execution and operation have received gratifying attention in the high places in the UNITED STATES GOVERNMENT and the place of the Engineering Profession in the matter has been fully recognized by the President of the United States.

President Roosevelt has appointed Hugh Hammond Bennett, Chief of the Soil Conservation Service, Morris Llewellyn Cooke, Administrator of the Rural Electrification Administration, and F. A. Silcox, Chief of the Forest Service, as a committee of engineers to organize an international conference of engineers in connection with the Third World Power Conference in September in the hope that some of the prominent foreign engineers might add to the store of knowledge on the subject from the records of their difficulties and successes.

While American Engineers are second to none in knowledge, ability or achievement, one reason for their outstanding position in the world is that they have ever been receptive and eager to learn and profit by the experiences of others and they will doubtlessly receive and use valuable data based on foreign experience and avoid the pitfalls thus disclosed at this conference.

It is of great interest to note that the members of the President's organizing committee are scheduled to take part in the CONNECTICUT ENGINEERING CONGRESS on July 25, in Bridgeport.

The President's letter of June 16th to Secretary Wallace appointing these Engineers is along the lines including Resolutions offered and procedures publicly urged by the Professional Engineers and is as follows:

June 16, 1936

Hon. Henry A. Wallace
Secretary of Agriculture
Washington, D. C.

My dear Secretary Wallace:

Up-stream engineering will have a major part in efforts to save the land and control floods, and for that reason it offers a broad field of opportunity for the engineering profession. I am therefore in hearty accord with your suggestion that there be held an open conference on the subject in the early fall. The date might well be in proximity to that of the Third World Power Conference in September, in the hope that some of the distinguished foreign engineers attending the latter may be interested also in contributing to the proposed conference.

There are indications that a substantial body of technical information on the control of little waters is now available in the scattered records of American experience—Federal, State and professional. The urgent problem is to bring these data together into a coordinated body of engineering knowledge so that public officials and engineers may have a more definite picture of up-stream engineer-

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ENGINEERING EDUCATION

Single General Course Advocated by Harvey N. Davis, President of Stevens Institute

The following is taken from the New York Times of July 4th:

REFORM IS PROPOSED IN ENGINEERING STUDY

Dr. H. N. Davis Favors a Single and Generalized Curriculum for Undergraduates

Johnsonburg, N. J., July 4.—Holding it impossible to gain in college an adequate knowledge in any special field, Dr. Harvey N. Davis, president of the Stevens Institute of Technology, predicted that in the future undergraduate engineering education would take the form of a single curriculum in general engineering. He spoke here this evening before fifty members of engineering faculties of twenty-seven colleges and universities who are attending the conference sponsored by the Society for the Promotion of Engineering Education and Stevens Institute.

"Engineering is the only type of training that has not wholly emerged from the apprenticeship or trade school phase," Dr. Davis said. "In engineering schools we have from four to forty different undergraduate curricula. It is time we began to think of training men for a profession, not for forty different trades. Four-year undergraduate courses are either too long or too short for effective specialization. Two years beyond high school is enough to turn out a top notch technician, and five or six years is none too long for the academic training of a prospective teacher, research and development man, or consultant in any of the major fields.

"There should be, and will be, a single engineering curriculum in general engineering with all the economics, psychology and general background studies you can crowd into it, with your technical emphasis on fundamental sciences and on general introductory courses in the major branches of engineering. Thus you give every man a chance to learn what the problems are like and how they should be solved."

Dr. Walter Rautenstrauch, Professor of Industrial Engineering at Columbia University, also was a speaker at the conferences. He said that on the basis of a theory he has evolved society is tending to organize itself after the pattern of the university.

"When the people become aware of the advantages of this form of organization," he said, "they probably will hold a constitutional convention and adopt a revised Constitution which will be more in accord with the principles by which our industrial civilization works and promote a better way of life."

MISUSE OF THE TERM ENGINEER

(*Continued from page* 8)

the earth is flat today, even a primary scholar of tender years would know better and class you as a faker, due to public education. In the same way the public is now fairly well educated to the distinction between an "Engineer" and an engine operator and in some states the law distinctly restricts the term to its

proper usage. Furthermore, as power plants become greater and more complicated the responsibility for their operation, as well as their design, construction and installation is being put under the direction of scientifically trained, university graduated professional Engineers more and more so that the control men in power stations will eventually all actually be real engineers and the incorrectly so called stationary and locomotive engineers will give way to specialists known and classified by proper designations.

It is a fact that the general public seems to have a much better knowledge of what the profession of an engineer is than a lot of the engine operators themselves. Ask any boy or girl of today in high school and with a fair I Q, what an "engineer" is and nine out of ten answers will be substantially correct.

On the other hand I have had several engine operators ask me if they couldn't apply for registration to the BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS and who seemed aggrieved and disbelieving when I told them in the most kindly and diplomatic way that without technical knowledge and practice that they could not obtain a certificate of registration and would only lose their application fee. In fact, I am afraid that I have fallen in their estimation because they thought that I could, if I would, help them to get registered by using my "influence."

It is true that the usage of the term "Engineer" in connection with engine operation dates back to the time when the early and real engineers built steam power plants and applied the ancient term "engine" to the new mechanism. These novel mechanisms were wonderful and ticklish creatures to control and were run at first by their designers and constructors or their engineering assistants, who, of course, were proper and real engineers. The misusage of the term started as the engine design was improved so that anyone could be trained to run them. Then the real engineers turned their efforts to advancing design and construction, and operators were hired to tend, shovel fuel, start and stop, oil, etc., and these operators were nicknamed with the title "Engineer" with less right and reason than Shirley Temple has to the title "Colonel" or a canal boatman has to the title "Captain." Just the exact year this grew to be a custom it is hard to say, but it was undoubtedly less than 100 years ago, or during my own father's life time. A misusage so comparatively recent will never materially affect the correct and ancient usage which will survive, and the suggestion that the real engineers relinquish their professional and legalized cognomen to a numerically much smaller and dwindling group who have no real claim to the term or what it stands for, is untenable. However, the engineer must be on his guard and individually, as well as through his professional societies, he must actively defend his title against unqualified users.

Newspapers must be asked to help educate their reportorial staffs as to what the designation "engineer" means. Directories, rosters, government documents, telephone books, etc., should be examined and pleasant, if possible, but firm and inflexible efforts made to stop its use in an unauthorized manner.

Unions, brotherhoods and other associations of engine men and their members should be persuaded to discontinue incorrect usage of the word and if the term "Engineer" appears in their association name or trade magazine, they should be asked to change it. It can be done. They assuredly do not want to sail under colors that do not belong to them.

All that is necessary is to change the last syllable of one word "Engin-eer" to Engin-ist or Engine-man, or Engin-ician, if an entirely new word is felt undesirable.

Can there be anything unreasonable about this?

As the enginists or enginicians are entirely dependent upon the "Engineer" and his science for the means by which they gain their livelihood, will they not cooperate?

Why should law be resorted to stop the unqualified use of the term in this instance as is done in the case of Doctors and Lawyers?

Possibly the title "Practical Engineer" could be conferred upon present users of the title whose only claim to it is years of usage and who hate to give it up, and then future recruits to the ranks of engine operators could be restricted to the new and proper term.

The present confusion is a nuisance not only to the Public but to the two groups themselves and is the cause of frequent misunderstandings, but the campaign for better general information on the correct usage of the term "Engineer" will largely eliminate these as well as work toward narrowing the usage of the term to its proper sphere.

HARRY E. HARRIS.

(Member A.S.M.E., S.P.E.E., N.S.P.E., N.Y.S.S.P.E., C.S.P.E.)

FLOOD CONTROL

(*Continued from page* 19)

ing as an important field of public and professional activity.

There is a wealth of experience and data as to down-stream engineering and works required for navigation, power development and flood control—levees, large dams, great reservoirs and channel improvements on major streams. But necessary as these are for the safeguarding of those who live in areas subject to destructive floods and of property located therein, it must be remembered that down-stream waters originate largely in up-stream areas. The objects of up-stream engineering are through forestry and land management to keep water out of our streams, to control its action once in the stream and generally to retard the journey of the raindrop to the sea. Thus the crests of down-stream floods are lowered.

In accordance with your further suggestion I am appointing as a committee to organize and promote such a conference or institute; Hugh H. Bennett, Chief of the Soil Conservation Service, Department of Agriculture; Morris L. Cooke, Administrator of Rural Electrification Administration; and F. A. Silcox, Chief of the Forest Service, Department of Agriculture.

Very sincerely yours,

FRANKLIN D. ROOSEVELT.

NEW YORK

(*Continued from page* 19)

sented as the toastmaster, by Mr. Roderick Stephens, President of the Bronx Board of Trade. Addresses were delivered by President Roosevelt, Hon. Harold L. Ickes, Secretary of the Interior and P. W. A. Administrator, Mayor LaGuardia, Hon. James J. Lyons, President of the Borough of The Bronx, Hon. Samuel Levy, President of the Borough of Manhattan, Hon. George U. Harvey, President of the Borough of Queens, Hon. George V. McLaughlin, Vice-Chairman of the Triborough Bridge Authority, and Mr. O. H. Ammann, Chief Engineer of the Triborough Bridge Authority.

The inclusion of Chief Engineer Ammann on the program of speakers on this occasion of dedicating to public use a great engineering project, in acknowledgement of the engineering services rendered in its prosecution and successful completion, is gratifying to the Engineering Profession.

BOARD OF DIRECTORS

(*Continued from page* 12)

Sacks, seconded by Engineer J. W. Dunham, and adopted:

Resolved, by the Board of Directors: That the same letter ballot covering the proposed change in the Constitution, known as Proposed Change Number One, 1936, which is hereby authorized for canvass on August 30th, shall include a provision for a vote by the membership as to whether or not the number of Vice-Presidents shall be increased from two to four.

4.—By-Laws. The following resolution was presented on a motion by Engineer A. V. Sheridan, seconded by Engineer S. I. Sacks, and adopted:

Resolved, by the Board of Directors: That a Committee on By-Laws is hereby created, having as its Chairman Engineer John W. Dunham, President of the District of Columbia Society of Professional Engineers, who has the power to appoint such additional members as he deems necessary for the purpose of drafting a proposed set of By-Laws.

5.—Roster. The following Resolution was presented by Engineer J. W. Dunham, seconded by Engineer S. I. Sacks, and adopted:

Resolved: That a roster be compiled and distributed to State Secretaries, with a recommendation that copies be retained in the County Chapter Secretary's office as well as the State Society headquarters for the convenience of members.

6.—Special Representatives

The Board of Directors named the following members as authorized representatives of N.S.P.E. to attend the following conferences:

A—Up-Stream Engineering Conference

To be held in Washington, D. C., September 22nd and 23rd, 1936.

Engineer Solomon M. Swaab, Fidelity-Philadelphia Building, Philadelphia, Pa.

Engineer Harry E. Harris, 229 Thorme Street, Bridgeport, Conn.

Engineer W. S. Conlon, National Press Building, Washington, D. C.

B—Third World Power Conference

To be held in Washington, D. C., September 7th to 12th, 1936.

Engineer John C. Riedel, 505 Macon Street, Brooklyn, New York.

7.—Nominating Committee

The following engineers were appointed to the 1936 Nominating Committee:

Samuel I. Sacks, Chairman, 921 Widener Building, Philadelphia, Pa.

John W. Dunham, 803 Quintana Place, N.W., Washington, D. C.

C. A. Lashbrook, 1145 N. W. Second Street, Ohlahoma City, Okla.

William C. Kammerer, 823 Prospect Avenue, Cleveland, Ohio.

J. E. Settle, Security Bank Building, Charleston, West Virginia.

8.—Minutes

The following resolution was presented by Engineer J. W. Dunham, seconded by Engineer S. I. Sacks, and adopted:

Resolved: That a digest of the minutes of this meeting and all subsequent meetings of the Executive Committee and the Board of Directors be published in the American Engineer.

9.—The meeting adjourned at 12:45 P. M.

10.—The above is to the best of my knowledge and belief a true statement of the minutes of the meeting of the Board of Directors held at the time and place stated.

Respectfully submitted,
WILLARD S. CONLON,
Executive Secretary.

July 27th, 1936.
Approved—President.

VIRGINIA

(*Continued from page* 18)

5. Unfinished Business.
6. Election of Officers (only at Annual Meeting).
7. Installation of Officers (only at Annual Meeting).
8. New Business.
9. Adjournment.

Article III

Officers

Section 1. President. It shall be the duty of the President to preside at all meetings of the State Society and of the Executive Board. He shall be, ex-officio, a member of all committees. He shall, subject to the Executive Board, have general direction of the business of the State Society.

Section 2. Vice-President. In the absence of the President or in case of his inability to act, it shall be the duty of the Vice-President to perform all the duties of the President.

Section 3. Executive Secretary. The Executive Secretary shall keep an accurate record of proceedings of the Society, of its membership and of the licensees of the State; shall conduct correspondence; and shall have custody of all official papers and records, subject to direction of the Executive Board. In the absence of the President and the Vice-President, he shall call the meeting to order and call for a motion for the election of a President, pro tempore. He shall issue all calls and notices ordered by the President or the Executive Board. He shall have such other duties and prerogatives as the Executive Board may assign to him. At the Annual Meeting he shall submit a written report covering the duties and activities of his office including a statement of the membership of the Society. At the expiration of his incumbency he shall turn over to his successor or to the Executive Board all books, documents, and other property of the Society in his custody, receiving a receipt therefor.

Section 4. Treasurer. It shall be the duty of the Treasurer to receive and, under the direction of the Executive Board, deposit and keep the records of accounts of the State Society, making a quarterly report of the receipts and disbursements to the Executive Board and an annual report to the Society at the Annual Meeting. At the expiration of his term of office he shall turn over to his successor, or to the Executive Board all books, papers and money belonging to the Society, taking a receipt therefor.

Article IV

Executive Board

Section 1. The Executive Board shall consist of eleven members, three elected odd year and two the even, each for term of two years, the Officers of the State Society and the two past State Presidents, and shall have general supervision of all matters pertaining to the State Society. No member of the Executive Board shall be eligible for reelection until the expiration of two years from the close of his last served term. Seven members of the Executive Board shall constitute a quorum. Between regular meetings it shall have the power to act for the Society whenever an emergency arises.

Article V

Committees

Section 1. There shall be two standing committees appointed by the President immediately after the annual election of officers of the Society, viz.:

A committee on membership and a committee on meetings.

Section 2. The Membership Committee shall investigate and report with recommendations, upon all candidates for membership and all petitions for the formation of District Chapters. It shall at all times seek to expand the membership and shall have the authority to make recommendations to, and to supervise the membership activities of the District Chapters. The Chairman shall make a short written report on the work of the Committee at the end of the year.

Section 3. The Committee on Meetings shall consist of five members, the Chairman of which shall be a member of the Executive Board. The membership shall be selected to represent as far as practicable the several branches of engineering, and applied science. This Committee shall invite and receive suitable communications and papers and arrange for their presentation at the State Society meetings by preparing the programs and sending out through the Executive Secretary the notices thereof for the respective meetings. The Chairman shall present a short written report on the work of the Committee at the end of the year.

Article VI

Dues and Assessments

Section 1. Dues. The dues of the State Society shall be five dollars per annum, due and payable at the beginning of the fiscal year.

Section 2. Apportionment of Dues. The dues of the State Society shall be apportioned as follows: One dollar shall be retained by the State Society for its own activities and four dollars shall be forwarded to the National Society. Of this four dollars, three shall be credited to the member as National Society dues and one dollar as a subscription fee for the magazine.

Section 3. Assessments. Assessments shall be entirely discretionary with the membership, shall be voted upon by letter ballot, and shall be considered only upon written recommendation of the Executive Board or of twenty-five members. The details of such assessments shall be determined at the time the matter is presented for consideration, and shall be set forth in the letter ballot. A two-thirds affirmative vote, with at least twenty per cent of the membership voting, shall be necessary to authorize levying of the assessment.

Article VII

Obligations

Section 1. How incurred. No obligations, except incidental expenses, shall be incurred and no continuing obligations entered into without a two-thirds affirmative vote at a meeting of the State Society and the approval of the Executive Board.

Section 2. How paid. The payment of all obligations shall be approved by the Executive Board, and all checks and vouchers shall be approved by the President and signed by the Treasurer.

Article VIII

Amendments

Section 1. These by-laws may be amended by the members at any meeting, provided that such amendment shall have been approved by the Executive Board. The Executive Secretary of the State Society, shall upon such approval, mail copies of the proposed amendment to the President and Secretary of each District Chapter, at least one month prior to the meeting at which the amendment is to be voted upon. A two-thirds affirmative vote of the delegates voting shall be required to amend these by-laws or any part thereof. A particular section of these by-laws may be suspended, by unanimous consent of the members present at any meeting, for a single stated purpose.

Section 2. When a proposed amendment is presented to the Executive Secretary of the State Society in writing and signed by twenty-five members in good standing, submission by the Executive Secretary of the State Society to the District Chapters, without approval of the Executive Board, shall be mandatory.

Section 3. Upon the attainment of a two-thirds majority at any meeting, any amendment to these by-laws shall become effective immediately.

EXAMINATION
LIEUTENANT, U. S. NAVY

(*Continued from page* 15)

sional (final) examination, to be held at the same places and immediately following the physical examination, open only to those who have passed the physical examination. Oral examination may be omitted by the Board.

2. ELIGIBILITY.—The examination will be open only to male citizens of the United States who comply with the following conditions:

(a) A candidate shall have passed his twenty-second birthday and shall not have pased his thirtieth birthday on January 1, 1937.

(b) A candidate must have received a degree from a college or university of approved standing, in some branch of engineering fitting him for the practice of engineering in the Corps of Civil Engineers, which practice is chiefly civil, mechanical, electrical, and architectural engineering.

(c) A candidate must have had, on June 30, 1936, not less than 3 years of practice of engineering, at least 2 years of which is subsequent to receipt of his first engineering degree.

(d) A candidate must be of good moral character and repute.

3. PRELIMINARY (NONASSEMBLED) EXAMINATION.—The data called for on form A should be filled in completely and forwarded to the Chief of the Bureau of Yards and Docks, Navy Department, Washington, D. C., so as to reach the Bureau not later than September 15, 1936. All candidates will be informed shortly after that date whether or not they have been found qualified for further examination.

4. REPORTING FOR EXAMINATION.—Candidates who are found qualified as a result of the preliminary (nonassembled) examination will be authorized to report for the physical and professional examinations at Washington, D.C., or at such other places in the United States as may hereafter be determined. These latter examinations will be held about October 15, 1936, the exact date to be fixed later. All expenses entailed by this trip are to be borne by the candidate. The travel allowances described in paragraph 11 below do not apply to candidates for a commission. Upon reporting, candidates will be examined physically by a board of medical officers of the Navy. If not found physically qualified the candidate will not be admitted to the professional examination. Candidates who qualify physically will report to the naval examining board for the professional examination.

5. PHYSICAL EXAMINATION.—The physical examination will be conducted in accordance with standards fixed by the Bureau of Medicine and Surgery as outlined herein. Any disqualifying physical defect, even if not mentioned herein, may be cause for rejection and no disqualifying physical defect will be waived in any case for any reason. A candidate must declare under oath that he labors under no mental or constitutional disease or weakness, nor any other imperfection or disability which may interfere with the most efficient discharge of the duties of an officer in any climate. Applicants will be required to satisfy the examining board regarding age. The minimum height is 5 feet 6 inches. Candidates must in general comply with the following physical proportions for height, weight, and chest measurement:

Height *Inches*	Weight *Pounds*	Chest [1] *Inches*
66	132	33½
67	134	34
68	141	34½
69	148	34¾
70	155	35½
71	162	36
72	169	36¼
73	176	36¾

[1] Mean circumference.

It is not necessary that the applicant should conform exactly to the figures in the foregoing table, which is given to show what is regarded as a fair standard of physical proportions. A variation not exceeding 15 pounds, not to fall below 132 pounds in weight or 1 inch in the mean chest measurement, below the standard given in the table, is admissible when the candidate for appointment is active, has firm muscles, and is evidently vigorous and healthy. A chest expansion of less than 2½ inches is a sufficient cause for the rejection of the applicant.

Any one of the following conditions will be sufficient to cause rejection:

(a) Feeble constitution, poor physique, impaired general health.

(b) Any disease or deformity, either congenital or acquired, which would impair efficiency, such as weak or deranged intellect, cutaneous diseases, parasites of the skin or its appendages, deformity of the skull, abnormal curvature of the spine, torticollis, inefficiency of joints or limbs, deformity of joints or bones, either congenital or the result of disease or injury, epilepsy, or other convulsions, diseases of the eye, defective vision, color blindness, impaired hearing or disease of the ear, chronic nasal catarrh, ozena, polypi, great enlargement of the tonsils, impediment of speech, disease of heart or lungs, enlarged abdominal organs, evidence of sclerosis, tumors, hernia, undescended testicle, large varicocele, sarcocele, hydrocele, stricture, fistula, hemorrhoids, varicose veins, disease of the genito-urinary organs, deformed or diseased feet, evidences of intemperance or the morbid use of drugs, loss of many teeth or teeth generally unsound (teeth properly filled not to be considered unsound). Every applicant must have at least 20 sound teeth, and of these not less than 4 opposed incisors and 4 opposed molars, of which 2 are directly opposed on each side of the dental arch.

(c) Any acute disease.

Acuteness of vision must be not less than 15/20 for each eye, unaided by glasses, and capable of correction by glasses to 20/20. The hearing must be normal (40/40 inches by watch and 15/15 feet by voice) for each ear.

Medical examiners may recommend for appointment a candidate who has a slight physical defect or varies slightly from the physical standards given herein if, in their opinion, such defects and variations are not such as to disqualify the candidate for appointment.

6. PROFESSIONAL EXAMINATION—The written examination will occupy about 5 days and will cover such subjects as the following (sample question papers for this examination are not available):

Mechanics of engineering, including statics and kinetics; theory of structures; surveying and mapping; materials of construction; design and construction pertaining to structural engineering, including buildings, foundations, waterfront structures, and retaining walls; details of steel and reinforced concrete construction; railway and highway engineering; hydromechanics, including water supply and sanitary engineering; dredging; mechanical and electrical engineering of power plants, distributing systems, and buildings; specifications and inspection; estimating costs; engineering thesis and general information.

The final rating of candidates will be based on their collegiate and professional records, the written examination, and general fitness. Candidates will not be examined directly in such subjects as grammar, physics, geology, arithmetic, or pure mathematics. The collegiate record together with the use of these subjects in the written examination will be taken as indicating their knowledge of these branches. The oral examination will be of short duration and general in character, but may be omitted by the board.

7. EVIDENCE OF AMERICAN CITIZENSHIP.—Each candidate found qualified as the result of the preliminary (nonassembled) examination shall mail to the examining board in Washington before the time of the professional examination satisfactory evidence of American citizenship, and no candidate can expect to be certified for appointment until this requirement is complied with.

Any one of the following is satisfactory proof of citizenship:

If native born—

(a) A duly verified copy of a public or church record of the birth.

(b) The affidavit, under oath, of the physician, midwife, nurse, or other person present at the birth.

(c) In cases where neither (a) nor (b) can be obtained by the candidate, the affidavit of a blood relation having such knowledge as to justify an affidavit.

(d) The affidavits of those persons who have known the applicant for 20 years, which affidavits should state the sources from which their knowledge was acquired in order to make their affidavits, and that they know the applicant to be a native-born citizen.

If foreign born—

Only those naturalized as minors before July 1, 1926, are eligible. Certificate of naturalization, under seal of the court in which naturalized, of the parent during minority of the candidate, together with the affidavit of a parent that the candidate is the child of the parent whose certificate of naturalization is submitted. If neither parent is living, then such other evidence of parentage as will satisfy the examining board.

8. THE CORPS OF CIVIL ENGINEERS, UNITED STATES NAVY, has an authorized strength of 131 officers with rank from rear admiral to lieutenant (junior grade).

9. RANK AND PROMOTION.—The rank given those commissioned from civil life in the Civil Engineer Corps of the Navy is lieutenant (junior grade). The ranks above lieutenant (junior grade), are lieutenant, lieutenant commander, commander, captain, and rear admiral. In the Civil Engineer Corps there is no fixed number established for any rank except that of rear admiral, in which

rank only one is authorized. Advancement to the ranks of lieutenant and lieutenant commander is by the selection of all those fitted for promotion; to the higher ranks, advancement is by the selection of those best fitted. While it is impossible to make any definite statements regarding promotion prospects, it is estimated that under normal conditions officers appointed from civil life will be eligible for selection for promotion to the rank of lieutenant after 3 or 4 years and to the rank of lieutenant commander after 12 or 13 years of commissioned service.

10. COMPENSATION. — Officers of the Corps of Civil Engineers receive the pay and allowances of their rank as provided for all other commissioned officers of the Navy. The pay of an officer is made up of the base pay for a given rank with longevity increase for length of service and with subsistence allowances; when Government quarters are not furnished an allowance is granted for rental of quarters. Where Government quarters are provided, heat and light are furnished. A reasonable amount of household furniture is also provided for such quarters. Government quarters are not usually available for the younger officers. An officer of the rank of lieutenant (junior grade) with dependents, when first appointed receives, including allowances, approximately $3,160 per annum; without dependents, including allowances, approximately $2,700 per annum. The base pay is increased every 3 years in all ranks up to and including captain. The pay and allowances for captain and lower ranks are limited to $7,200.

11. TRAVEL ALLOWANCES.— Actual expenses as per allowance lists, or mileage in lieu of all expenses, at the rate of 8 cents per mile, is allowed an officer traveling on official duty within the United States by other than Government conveyance. Outside the country actual expenses are paid as per allowance lists. An officer having a wife or dependent children, when ordered to make a permanent change of station, is allowed transportation to his new station for his wife and dependent children, and his household effects are shipped without cost to him, subject to prescribed limits as to total weight, which increase according to the rank of the officer. Traveling expenses or mileage in lieu thereof is allowed on original appointment to first post of duty, provided the appointee has executed the oath of office, but transportation to first post of duty for dependents and household effects is not furnished free of cost.

12. RETIREMENT.—All officers must retire from active duty upon attaining the age of 64 years. They may be retired at any time before reaching 64 years because of physical disability incurred in line of duty. Retired pay is three-fourths active duty pay, exclusive of allowances, at the time of retirement for age or physical disability. Officers may also be retired for failure to be selected for promotion at any time during their service at reduced retired pay.

13. SICK BENEFITS.—In case of illness an officer is entitled to medical attendance and hospital accommodation. The only charge is for cost of subsistence while in the hospital. He receives full pay while on the sick list. At navy yards or naval stations families of officers are also given free medical attendance whenever a naval medical officer is available.

14. LEAVE.—An officer may be granted leave with full pay at a rate not to exceed 1 month in each fiscal year. This leave may be allowed to accumulate for 4 years. The officer has no inherent right to leave and it may not be granted if the exigencies of the service will not permit.

15. UNIFORM.—Officers on duty at a navy yard or naval station are generally required to wear the naval uniform prescribed for their rank and corps. It is estimated that the complete outfit, which includes blue service uniform, frock coat, evening dress uniform, full dress trousers, service caps, chapeau, epaulettes, dress and undress belts, sword and sword knot, overcoat, raincoat, boat cloak and four white service uniforms, may be purchased for approximately $475.

16. ASSIGNMENT TO DUTY.—Officers in the Civil Engineer Corps are detailed for duty principally at the various navy yards and naval stations in the United States and its possessions, but are also subject to assignment anywhere in the world. The usual tour of duty varies from 2 years for junior officers to 4 years for senior officers. Sea duty for such officers is not contemplated, but there is no legal restriction against it. The localities to which officers will be assigned cannot be stated in advance.

17. WORK OF THE CORPS OF CIVIL ENGINEERS.—Officers of the Corps of Civil Engineers are charged with the execution of the duties placed by law and regulations under the cognizance of the Bureau of Yards and Docks, one of the administrative divisions of the Navy Department. The work is exceptionally varied, and offers an attractive field for able and ambitious engineers. The Bureau of Yards and Docks is charged with the construction and maintenance of all facilities entering into the "shore establishment" of the Navy. The wide scope of engineering activities for which members of the corps are appointed is represented by the duties assigned to the Bureau of Yards and Docks, which comprise all that relates to the design and construction of public works of the Naval Establishment ashore, such as dry docks, marine railways, shipbuilding ways, harbor works, quay walls, piers, wharves, slips, dredging, landings, floating and stationary cranes, power plants and power distributing systems, and fueling plants; heating, lighting, telephone, water, sewer, and railroad systems; roads, walks, grounds, and landing fields; bridges, radio towers, hospitals, shops, barracks, magazines, and all buildings for whatever purpose required. The Bureau provides for the general maintenance of the foregoing, except at certain stipulated localities, and it designs and makes estimates for new work after consultation as to their operating features with the bureau or office for whose use they are primarily intended. It has charge of all means of land transportation required at navy yards and naval stations, and the design and maintenance of handling devices, such as derricks, shears, and locomotive cranes.

ENGINEERING EDUCATION

(*Continued from page 5*)

the single degree of Bachelor of Engineering for all undergraduate students of engineering.

Recently Yale University paved the way and on July 4th, as may be noted under General Items, Harvey N. Davis, President of Stevens Institute of Technology, records his conviction that engineering education will shortly take the form of a single curriculum in general engineering.

The American Engineer has, over a period of five years, first as a State, and later as a National organ, proposed engineering educational reforms and trusts that its labors may yet prove fruitful.

EMPLOYMENT FOR ALL

(*Continued from page 7*)

become imminent in any district, it would become necessary to reduce the percentage amount of the "Re-employment Assessment" so that the employer would not accumulate an over-supply of "Re-employment Certificates" which he could not currently use. This reduction would be effected by proper adjustment of an application for such reduction to the "Re-employment Assessment Authority." The employer would be granted a reduction in his assessment rate proportional to the decrease in number of workers registered in the local Re-employment Offices. In this manner the operation of the program will force down the rates of the "Re-employment Assessment," to a point where it will be *discontinued* after all normal and able-bodied persons would be working as regular employees at standard remuneration.

There is always wide spread objection to the levying of any additional tax. We are especially aware of a sales tax because one's attention is called to it during every purchase. Everyone would be conscious of the "Re-employment Assessment," and its purpose, and realize that every effort should be exerted toward furnishing *gainful* employment to every available willing worker. The feature of the assessment rate rapidly diminishing in proportion to the increase of regular employment would also stimulate a prompt and concerted effort on the part of business organizations toward conscientious execution of the provisions of the plan.

This program is designed to make it possible for American citizens who are the victims of this economic depression, through no fault of their own, to *help themselves* by *working for* and *earning their livelihood.*

God grant that our combined efforts may prove as successful as those of that able American statesman, Abraham Lincoln, to the "end that this government of the people, by the people, for the people shall not perish from the earth."

We may all swell with pride to participate in such a program as has just been placed before you, if it can accomplish for America that much needed re-employing of the enforced idle and once more places in circulation the money which is today failing in its main purpose of creating a cycle of purchasing power. The stagnation of industry here is due almost entirely to this condition and it is believed that a corrective measure is herewith offered for your consideration. Comments and constructive criticism will be welcomed, as will a Congressional investigation.

ENGINEERING EDUCATION

(*Continued from page* 11)

his way in, despite any hurdles that may be set up; that type does not need any proselytizing or "vocational guidance" to induce him to apply for engineering school enrollment. And any boy with the "God-given ability" will not be kept out by any entrance examinations or aptitude tests that the educators will plan and conduct. It is the opposite type, without engineering ambition and aptitude, who should be diverted to other callings,—as the best thing for these young men, their fellow students, and the Profession as a whole.

When I see the organized educators maintaining a closed mind on this subject, with a volley of fire against any proponent, I begin to wonder whether the initials S.P.E.E. do not really signify the "Society for the Promotion of Engineering Enrollment". As a member of S.P.E.E. since 1910, I should like to see that organization take a more open-minded attitude on the problems of the Profession.

4. The charter of the Engineers' Council for Professional Development, adopted upon formal organization in 1932, records the following as the first of the four major planks in its program:

"(a) To develop further means for the educational and vocational orientation of young men with respect to the responsibilities and opportunities of engineers, in order that *only* those may seek entrance to the profession who have the high quality, aptitude, and capacity which are required of its members."

I have italicized the word *"only"*, because it is the most important word for interpreting the intent and for gauging the sincerity of this program. With that word, the program means selective enrollment; without that word, the program means enrollment promotion. Euphemistic phrasing may obscure, but cannot change, this distinction.

I hereby challenge the E.C.P.D. to show its sincerity with respect to carrying out this announced program. The engineering educators are in control of E.C.P.D., and I predict that no program of selective enrollment will ever be recommended by E.C.P.D. The word *"only"* will be tacitly forgotten, and the meaning and purpose of that program will thereby be perverted. E.C.P.D. has an opportunity to demonstrate its honesty and good faith by proving my prediction to have been wrong.

In line with the four cardinal divisions of its program, E.C.P.D. has four standing committees, the first of which is the "Committee on Student Selection and Guidance". In its first annual report, this committee reported its conclusion that "Selection" was impracticable, and that its activities were to be concentrated on "Guidance". It has become virtually a "Committee on Student Guidance",—guidance *into* the engineering schools. It is all part of the program,—including the distribution of promotional literature, addressing high school students and their parents, and running "vocational guidance" camps,—to stimulate additional enrollment in the engineering schools. Every suggestion of "Student Selection" is met with alibis, and is put off with a far-fetched quest for "aptitude tests" and "correlation coefficients".

The obvious solution, appealing to common sense and conforming to the very foundation of all engineering study, would be to require all enrollment applicants to pass a College Entrance Examination in Mathematics and Physics. It is difficult to conceive how a student can profitably spend his four years in an engineering school without a preliminary mastery of at least these two High School subjects. Of all pre-college studies, Physics and Mathematics are the most important and indispensable preparation for engineering study and application. The lack of this preparation must inevitably hold back proper progress in the engineering curriculum. The limited time in the usual four-year engineering course is too precious to spend in teaching elementary foundation subjects that should be thoroughly covered in the secondary school preparation.

In response to my repeated recommendations along this line, the chairman of the E.C.P.D. Committee on "Student Selection and Guidance" writes me. "No doubt, you are correct in stating that mathematics and physics are the foundation subjects for all enginering curricula . . . If we were to require high school physics for admission, it would necessitate a general agreement amongst the engineering colleges that this was necessary. *If one college required physics and others did not, the former would be faced either with a reduced enrollment* or with the acceptance of students who were deficient in physics. At the time of the Investigation it was found that a considerable number of institutions admitted students deficient in mathematics. I hope and believe that the engineering colleges have moved forward from that position and that few are admitted who are deficient in mathematics."—(The italics are mine. There is the crux of the problem. Competition for enrollment is always the first consideration, rather than the standards of the Profession.)

It is also argued that the engineering schools can teach Physics better than the High Schools, but what a deplorable waste of time this is in the crowded four-year curriculum! A course in College Physics is generally given in the Sophomore year, but it has to start from scratch and proceed on a more elementary plane to accommodate those students who have not had the preparation of a course in High School Physics. Less ground can be covered. The more advanced students are retarded, and the others do not make up for their handicap. The published report of the 1934-35 College Physics Testing Program clearly shows the marked difference in results on the Cooperative Physics Tests (measuring achievement in College Physics) as between the students who studied Physics in High School and those who did not. As the report states, "The group that studied Physics in high school is consistently at or above the national average, while the other group is consistently below." This report also confirms the high correlation between proficiency in Physics and engineering ambition or aptitude. As stated in the report, "Fig. 6 indicates, quite within expectations, that the group looking forward to engineering is higher in Physics than any other pre-professional group. . . . The differences, after discounting all vitiating factors, are large enough to be suggestive of guidance possibilities."

The medical schools require all candidates for admission to have completed two, three, or four years of pre-medical study at a College of Liberal Arts and, as an additional requirement, to show specified numbers of credits successfully completed in College Physics, College Chemistry, College Biology, Physical Chemistry and Organic Chemistry, before matriculation. Mastery of these *College* courses is established as part of the prerequisites for admission. The engineering schools hesitate to require even High School Mathematics and High School Physics. The individual school fears it will lose in the competition for enrollment if it adopts even these elementary and obvious standards. What a pitiful spectacle is presented by the engineering schools in comparison with those in Medicine! In the Medical Profession, the educators had vision and led in the progress toward higher standards and standing; in the Engineering Profession, the educators are resisting and retarding that progress.

5. As far back as 1903, when the suggestion was made to a prominent member of S.P.E.E. that it might be well to extend engineering courses to five years, the reply was, "Young man, if you want to lose your job, just suggest a five-year course at your university."

After a number of universities had adopted five-year courses in Engineering, the trend of progress was checked by an adverse report of an S.P.E.E. committee on this subject in 1927.

Here and there, an engineering school has been courageous enough to adopt a five or six year curriculum, or to arrange for one or two years of pre-engineering college work. Most of the engineering schools, however, have throttled any suggestion to raise their curricula toward a truly professional or graduate school level, preferring to remain on the lower plane where they could compete with the Arts College, the Forestry School, or the School of Agriculture, for student enrollment. That is where the slogan, "Engineering—A Career—A Culture", comes in. The few engineering schools that offer the longer or more advanced curricula have generally attached a string of degrees as compensating bait: one degree for a four-year course, two degrees for a five-year course, and three degrees for a six-year course. Bargain counter inducements,—all in competition for enrollment!

On this subject, one educator writes: "Prominent schools have adopted five- and six-year courses and have had to drop them, for they could not *compete* with schools of equal prominence that held to the four-year course. It would seem that there is little possibility of a long curriculum proving successful until all of the important schools of the nation make a concerted move for such a course." Again, competition for enrollment appears as the governing consideration, rather than perfection of the educational training and its product.

The content of engineering knowledge now available and required for practice in any one branch of the Profession has grown enormously since a generation, or a century, ago. It has become too much to pack into a crowded four-year course, particularly if the curriculum has to make up for deficiencies of high school preparation besides covering any cultural,

economics, or English courses. Two years of pre-engineering college work as a prerequisite would solve the problem, relieving the professional course proper of its deficiencies and its over-crowding and permitting faster progress and higher standards to be attained. This suggestion is suppressed as heresy by the engineering educators. Practically all medical schools and the leading law schools have been established on a graduate level, but engineering schools cling to the lower status. Here is another opportunity for S.P.E.E. to prove that it has vision and leadership, and for E.C.P.D. to prove its sincerity in its stated purpose "to enhance the professional status of the Engineer."

6. Little need be said here of the practice of individual educators, taking advantage of their salaries, facilities, equipment, and student assistants, to compete with Engineers in outside practice by seeking and taking consulting or designing engagements for fees far below any decent professional standards. Numerous instances can be cited. These educators should realize that they are thereby destroying the standards under which their own graduates have to earn a livelihood and that they are thus helping to bring the entire Profession down to a starvation level. It is desirable, of course, for teachers of engineering to maintain outside contacts with the field of practical experience, but they should not use the security of their salaried positions to take prospective work away from unemployed Professional Engineers in times of economic stress, nor to take the work for a fee that is but a fraction of that which the outside Engineers must charge to cover their expenses.

Conclusion:

All that has been said in the foregoing is intended as sincere constructive criticism. It is presented with all due respect for the many educators who have exemplified, in their lives and in their work, the highest qualities of self-sacrifice, vision, and leadership in genuine cooperation with the ideals and the aspirations of the Engineering Profession. The National Society of Professional Engineers is proud to have many such educators enrolled among its officers and members, and is ready to cooperate wholeheartedly with any other group or organization that places the Profession before self-interest.

STATE SOCIETIES AND COUNTY CHAPTERS

(*Continued from page* 14)

Article—Dues: The dues of this Chapter, to be collected by the Chapter, shall be ( )* dollars per annum, due and payable at the beginning of the fiscal year on January first. These dues shall be apportioned as follows: ( ) dollars shall be retained by the Chapter for its own activities and ( ) dollars shall be promptly transmitted to the State Society to cover State Society dues, National Society dues, and subscription to the American Engineer.

* The State Society and its Chapters shall have the right to determine the amount of dues required over and above the four dollars ($4.00) payable to the National Society.

PENNSYLVANIA

(*Continued from page* 15)

The sudden pretense of the need for professional engineering voice has long been anticipated and acted upon in the State of Pennsylvania. Any attempt to break down the Pennsylvania Society should be openly and effectively opposed. The National Society will lend its support if required.

Philadelphia Chapter Holds June Meeting

The American Engineer is indebted to Treasurer Milton H. Blez, of the Philadelphia Chapter, for the following report of its June meeting:

The monthly meeting of the Philadelphia Chapter was held on Thursday, June 4th, at the Engineers Club. The following officers were elected:

President, Ralph Mellor, 1 year; Vice-President, John Edgar Hires; Secretary, Walter E. Witte; Treasurer, Milton H. Blez; Directors, Wilbert C. Cornell, 2 years; Henry F. Bamberger, 2 years.

The retiring president, Engr. Samuel Sacks, reviewed the work of the previous year which has resulted in a substantial gain in membership and an increased prestige for the society. He reported that the chapter officers had cooperated with the officers of the state and national societies in organizing chapters throughout the state and establishing the state society on a truly representative basis. A warm vote of thanks for his work on our behalf was tendered Engr. Sacks who promised his continued aid and support.

Engr. Townsend reported on a meeting of the Lehigh Valley Chapter which some members of the Philadelphia Chapter attended. The Chapter wishes to congratulate the Lehigh Valley Chapter on its progress and spirit. When the program for the coming season is prepared it will be published in this journal and we shall be pleased to welcome visitors from other chapters.

Engr. Sacks reported an interview with Governor Earle, who promised to fill the vacancies on the State Board of Examiners from a list of names to be submitted by a committee composed largely of members of the P.S.P.E. The meeting was addressed by Mr. E. Kaye Hunter, Assistant Administrator of the W. P. A., who reviewed the work of that organization in the Philadelphia area and explained its administration. This was followed by a discussion of the effects of the W. P. A. on the engineering profession. Considerable difference of opinion was expressed,—some engineers who had been employed thereon feeling that it has been of great benefit, both to the engineers and the public, while others who are employers, complained of the inability to get help, for the reason that the men employed on W. P. A. are unwilling to give up their jobs for temporary employment. It was suggested to Mr. Hunter that it would be desirable to allow W. P. A. employees a leave of absence when temporary private employment was offered, thus benefiting the employer and allowing the employee to make additional money without seriously affecting the work of the W. P. A. The consensus of opinion was that employment opportunities for engineers are vastly improved.

The regular meetings which are held on the first Thursday of each month will be discontinued until October. The interim will be spent by the officers and committees in organizing activities for the coming year.

OHIO

(*Continued from page* 18)

leadership through its splendid record of accomplishments. Every engineer in Ohio should be proud to be a member of his State Society.

The engineering profession needs to be defined, organized and integrated.

It is *defined* by Engineers Registration Laws. No man is an engineer unless he is registered under the State laws.

It is *organized* in the National Society of Professional Engineers, the State Societies, and the County Chapters.

It is *integrated* by perfecting the interlocking of the National, State and County units so that every member of one shall be a member of all.

We have to conduct our campaigns on all three fronts, for the advancement of the engineering profession in public service and in public recognition.

Society Honors Legislator

From the Enquirer of Cincinnati comes the following account of the recognition accorded Senator Edward N. Waldvogel for his legislative endeavors in behalf of the profession:

An engraved silver honorary life membership card in the Ohio Society of Professional Engineers was presented to Senator Edward N. Waldvogel at Coney Island last night. It was the first annual regional meeting of the society. Cincinnati Chapter, Registered Professional Engineers, was host to the more than 100 visiting delegates.

Perry Ford, Columbus, Secretary of the Ohio Board of Registration and President of the Ohio Society, presented the card to Senator Waldvogel for "his excellent efforts in behalf of the engineers of Ohio."

E. A. Munyan, Chairman of the Cincinnati Chapter, was toastmaster.

Among delegates were Hal G. Sours, Akron, President of the Ohio Board of Registration, J. O. McWilliams, Cleveland, and Walter Graf, Lancaster, Board members.

Sours declared that 7,800 applications for registration have been made to date, with 6,300 of that number approved. There are 2,850 registered surveyors in Ohio, he said. The next examination for registration will be held late next month.

TEXAS

(*Continued from page* 18)

priated by Legislatures and the Congress for surveys extended to all tributary stream sources by qualified engineers; (3) that funds be appropriated by Legislatures and the Congress for the achievement of scientific flood control with attendant conservation planned and executed by fully qualified engineers; (4) that the selection of all executive and engineering personnel be made entirely upon the basis of character, engineering ability, and reputation.

FURTHERMORE, BE IT RESOLVED:

That a copy of this RESOLUTION be sent to the President of the United States of America, to the Governor of Texas, to the Texas Representatives in the Congress, to the members of the Texas Legislature, to the National Society of Professional Engineers, to the newspapers of Texas, urging their support and endorsement of this RESOLUTION.

HUGH A. KELLY

... Civil Engineer ...

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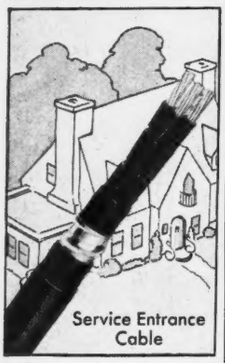
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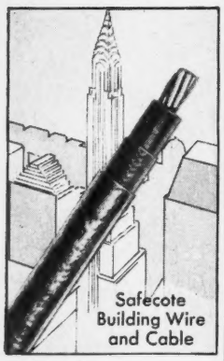
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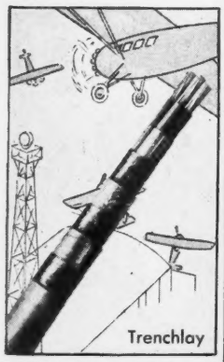
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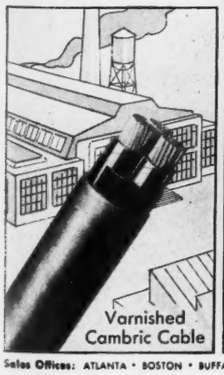
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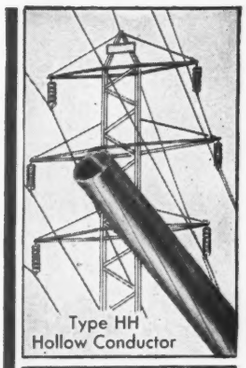
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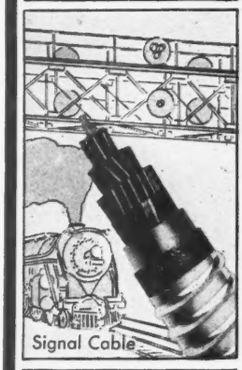
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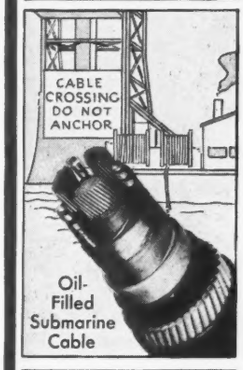

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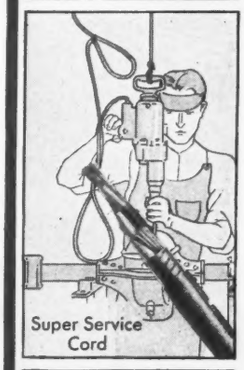
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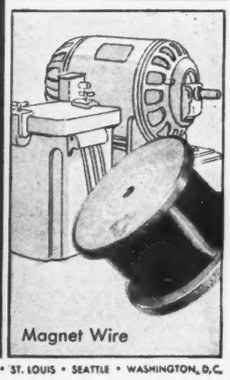
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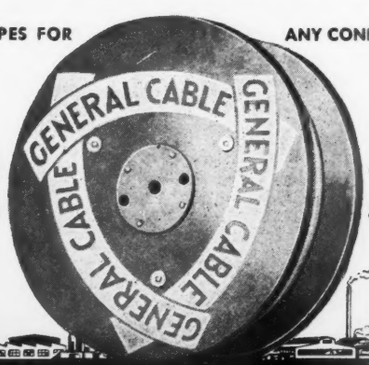

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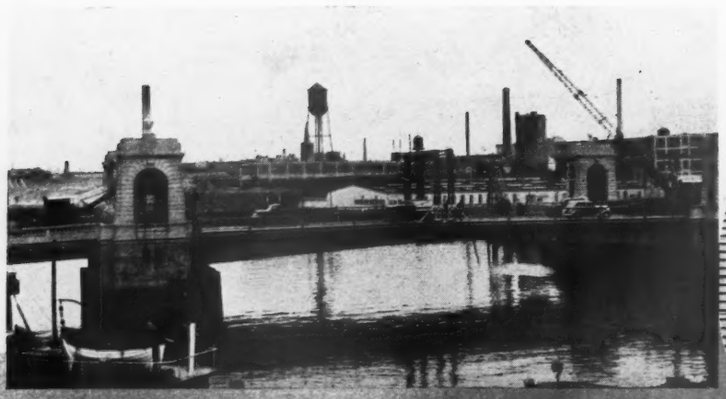

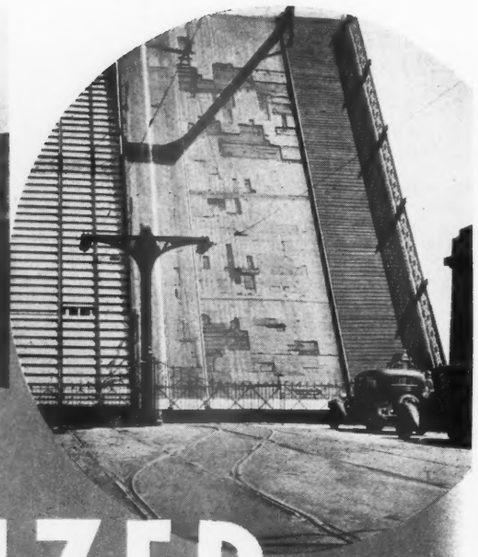

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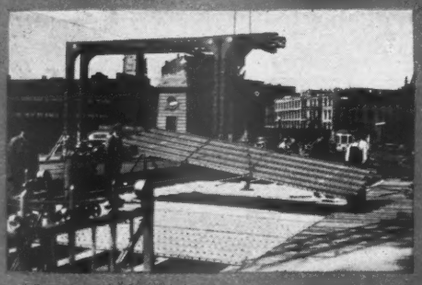

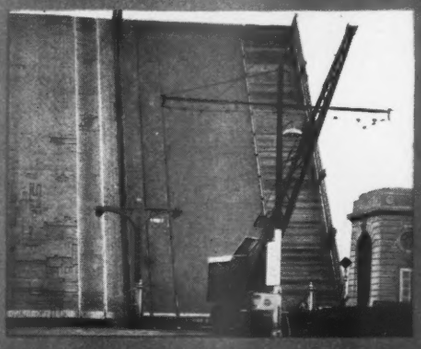

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